DRAFT PHASE II REPORT

ENGINEERING INVESTIGATIONS
AND EVALUATIONS AT
INACTIVE HAZARDOUS WASTE DISPOSAL SITES

NASH ROAD LANDFILL
NIAGARA COUNTY, NY

Dames & Moore

13305-003
August 1984

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Nash Road Landfill

* Chemical Analysis of the water samples isn't complete

	S	S^2
Groundwater Route Score (S_{gw})	5.65	31.92
Surface Water Route Score (S_{sw})	10.07	101.40
Air Route Score (S_a)	0.00	0.00
$S_{gw}^2 + S_{sw}^2 + S_a^2$		133.32
$\sqrt{S_{gw}^2 + S_{sw}^2 + S_a^2}$		11.54
$\sqrt{S_{gw}^2 + S_{sw}^2 + S_a^2} / 1.73$		S_M = 6.67

WORKSHEET FOR COMPUTING S_M

Aquifer of concern - not used for drinking H_2O.
(industrial use)

GROUND WATER ROUTE WORK SHEET

Rating Factor	Assigned Value (Circle One)	Multi-plier	Score	Max. Score	Ref. (Section)
1 Observed Release	0 (45)	1	45	45	3.1
If observed release is given a score of 45, proceed to line 4. If observed release is given a score of 0, proceed to line 2.					
2 Route Characteristics					3.2
Depth to Aquifer of Concern	0 1 2 3	2		6	
Net Precipitation	0 1 2 3	1		3	
Permeability of the Unsaturated Zone	0 1 2 3	1		3	
Physical State	0 1 2 3	1		3	
Total Route Characteristics Score				15	
3 Containment	0 1 2 3	1		3	3.3
4 Waste Characteristics					3.4
Toxicity/Persistence	0 3 6 9 12 15 (18) (Pb)	1	18	18	
Hazardous Waste Quantity	0 1 2 3 4 5 (6) 7 8 (900 yd³)	1	6	8	
Total Waste Characteristics Score			24	26	
5 Targets	(industrial use only)				3.5
Ground Water Use	0 (1) 2 3	3	3	9	
Distance to Nearest Well/Population Served	(0) 4 6 8 10 12 16 18 20 24 30 32 35 40 (No people)	1	0	40	
Total Targets Score			3	49	
6 If line 1 is 45, multiply 1 x 4 x 5 If line 1 is 0, multiply 2 x 3 x 4 x 5			3240	57.330	
7 Divide line 5 by 57.330 and multiply by 100	S_{gw} = 5.65				

SURFACE WATER ROUTE WORK SHEET

	Rating Factor	Assigned Value (Circle One)	Multi-plier	Score	Max. Score	Ref. (Section)
1	Observed Release	0 (45)	1	45	45	4.1
	If observed release is given a value of 45, proceed to line 4. If observed release is given a value of 0, proceed to line 2.					
2	Route Characteristics					4.2
	Facility Slope and Intervening Terrain	0 1 2. 3	1		3	
	1-yr. 24-hr. Rainfall	0 1 2 3	1		3	
	Distance to Nearest Surface Water	0 1 2 3	2		6	
	Physical State	0 1 2 3	1		3	
	Total Route Characteristics Score				15	
3	Containment	0 1 2 3	1		3	4.3
4	Waste Characteristics					4.4
	Toxicity/Persistence	0 3 6 9 12 15 (18)	1	18	18	
	Hazardous Waste Quantity	0 1 2 3 4 5 (6) 7 8	1	6	8	
	Total Waste Characteristics Score			24	26	
5	Targets					4.5
	Surface Water Use	0 1 (2) 3	3	6	9	
	Distance to a Sensitive Environment	(0) 1 2 3	2	0	6	
	Population Served/Distance to Water Intake Downstream	(0) 4 6 8 10 12 16 18 20 24 30 32 35 40	1	0	40	
	Total Targets Score			6	55	
6	If line 1 is 45, multiply 1 x 4 x 5 If line 1 is 0, multiply 2 x 3 x 4 x 5			6480	64,350	
7	Divide line 6 by 64,350 and multiply by 100	S_{SW} = 10.07				

AIR ROUTE WORK SHEET

Rating Factor	Assigned Value (Circle One)	Multiplier	Score	Max. Score	Ref. (Section)
1 Observed Release	(0) 45	1		45	5.1
Date and Location:					
Sampling Protocol:					
If line 1 is 0, the S = 0. Enter on line 5. If line 1 is 45, then proceed to line 2.					
2 Waste Characteristics					5.2
Reactivity and Incompatibility	0 1 2 3	1		3	
Toxicity	0 1 2 3	3		9	
Hazardous Waste Quantity	0 1 2 3 4 5 6 7 8	1		8	
	Total Waste Characteristics Score			20	
3 Targets					5.3
Population Within 4-Mile Radius	0 9 12 15 18 21 24 27 30	1		30	
Distance to Sensitive Environment	0 1 2 3	2		6	
Land Use	0 1 2 3	1		3	
	Total Targets Score			39	
4 Multiply 1 x 2 x 3				35,100	
5 Divide line 4 by 35,100 and multiply by 100	S_a = (0)				

SECTION I

EXECUTIVE SUMMARY

The Nash Road site is an inactive landfill located in the Town of Wheatfield, Niagara County (NYS) adjacent to the North Tonawanda City boundary (Figure I.1). The site is rectangular totaling approximately seven acres. The Nash Road site is located in a suburban residential area, and is partly overgrown with trees and marsh vegetation. Nearby residents use the site as a jogging area, dirt bike track, and play area.

The Nash Road site was operated by Niagara Sanitation Company between 1964 and 1968. Both municipal and industrial wastes, including caustic materials and sludges, are disposed at the site. In addition, between 6/6/68 and 7/15/68, approximately 900 cubic yards of chemical waste from Love Canal was disposed in an excavated trench on this site (memo of 8/9/78 to Hennessey, NYSDOT).

Although some wastes are covered, protruding refuse is visible from the ground surface. Current concern centers on the possibly unsafe containment of the potentially toxic waste and the migration of these wastes offsite.

The Phase II investigation consisted of surface water, sediment, and groundwater sampling and analyses in order to identify the occurrence and location of contaminants and to assess the degree of hazard associated with the dumping history of the site (Figure

I.2). Seven onsite groundwater wells were installed and aquifer testing was performed. Water samples were tested for the 15 Love Canal indicator parameters (methylene chloride, chloroform, carbon tetrachloride, benzene, toluene, chlorobenzene, 1,1,2-trichloroethane, tetrachloroethene, 1,1,2,2-tetrachloroethane, trichloroethene, trichlorobenzene (and isomers), dichlorobenzene (and isomers), hexachlorobutadiene, total organic halogens and pH). Sediment samples were tested for the 15 indicator parameters and for Pb, Cr, Cd, Cu, CN, Hg, Ni, and Zn. Geophysical surveys and downhole geophysics were used to help delineate the details of subsurface hydrogeology. Surface water samples were found to contain small amounts of methylene chloride and total organic hologens; no other indicator parameters were detected.

Site stratigraphy can be summarized as follows:

mixed sand/waste fill
silt (MC)
upper sand (SP)
clay (CH and CL with sand seams)
lower sand (SP)
till (GM)
dolomite bedrock

Most waste was mixed with and covered by the upper sand. The disposal trench for Love Canal waste was excavated through the sand into the lower clay unit.

Well screens were placed in the till and the silt/upper sand units. One round of water samples was taken; chemical analysis

of this water is not yet complete. The piezometric surface within the fill shows a groundwater high beneath the north-center part of the site.

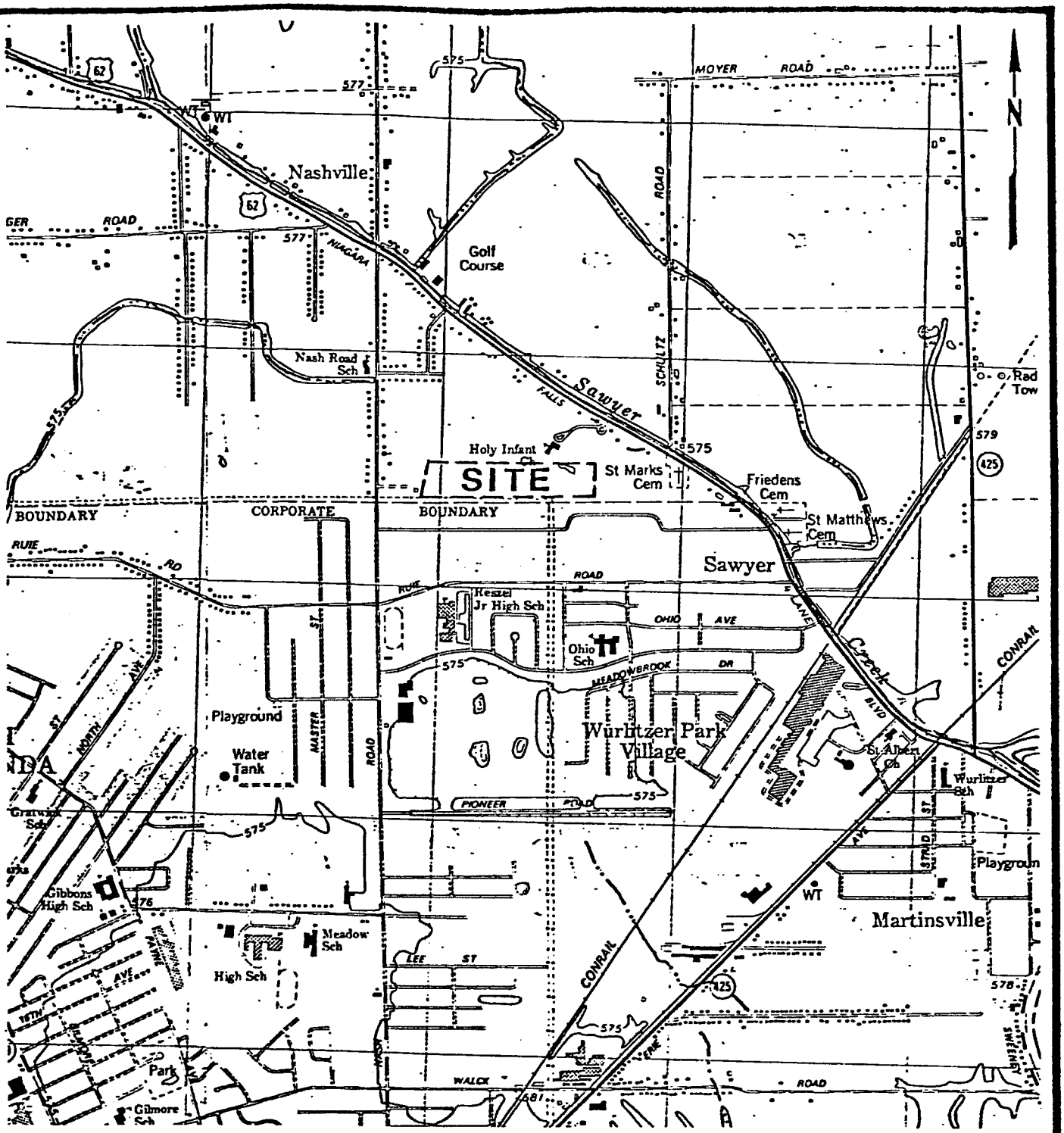
Based upon the results of this study, the HRS for the Nash Road site has been revised as follows:

$S_M = 6.67$

$S_{FE} = 26.25$

$S_{DC} = 37.50$

These scores will be reexamined when the final chemical results become available.



SITE COORDINATES: 43°04' 10.0" N. LAT
78°51' 33.8" W. LONG

REFERENCE: U.S.G.S. 7.5' TOPOGRAPHIC MAP
TONAWANDA EAST, NY (1980) AND
TONAWANDA WEST, NY (1980) QUADRANGLES

SITE LOCATION MAP
NASH ROAD SITE

DAMES & MOORE

FIGURE I.1

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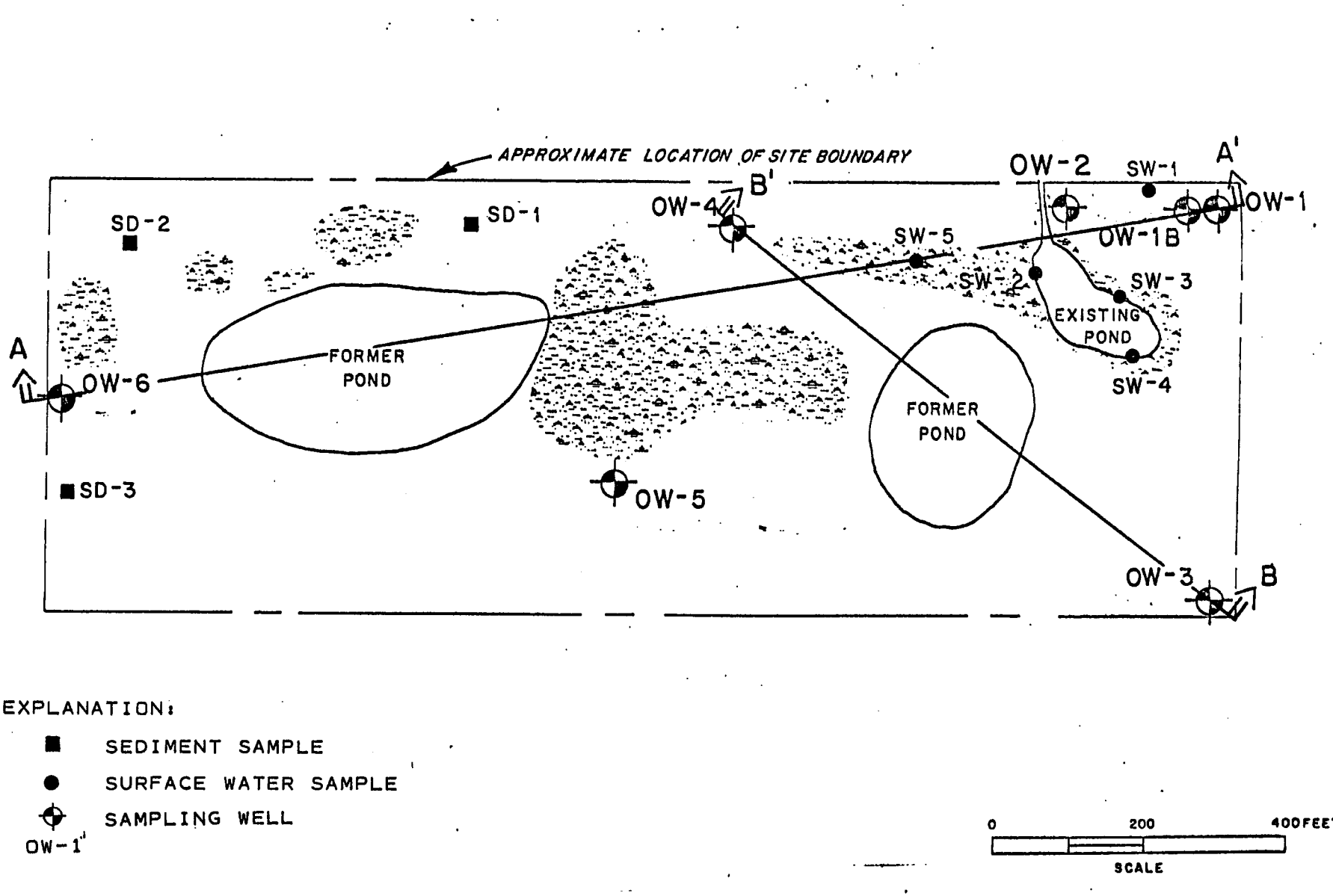
BY D. Tomes DATE 8/3/84



PLOT PLAN
SHOWING CROSS SECTION LOCATIONS
NASH ROAD SITE

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FIGURE I.2

SECTION II

PURPOSE

Purposes

The Nash Road site is an inactive disposal area containing municipal wastes and industrial wastes, including chemical wastes from Love Canal. Disposal has occurred in and above lacustrine sands and clays; there are no engineered containment facilities on the site.

The purposes of the Nash Road Phase II Site investigation were 1) to identify the presence and location of hazardous wastes, 2) to determine if any imminent hazard exists, 3) to gather necessary information and to complete the HRS scoring, and 4) to prepare a site investigation report.

SECTION III

SCOPE OF WORK

Scope of Work

Phase II investigations at the Nash Road site were begun in June, 1983 in conjunction with Phase I investigation and are ongoing as of the date of this report. The scope of the investigation was originally presented in the Phase I report (June, 1983) and later in the Quality Assurance Project Plan for Nash Road and Solvent Chemical Sites (March, 1984). During the performance of the field investigation, the scope of the work was expanded at the request of the NYSDEC, in order to obtain a more comprehensive understanding of the entire Nash Road landfill.

The scope of our investigation is summarized in tabular form and is presented on Table III.1 and is summarized below.

Step 1 - Emergency Evaluation Surface Water

A surface water monitoring program was implemented in June 1983 to determine if any imminent hazard exists at the site and to evaluate the movement of surface contaminants in a northerly and northeasterly direction. Five surface water samples were collected around the ponds, ditch, and disposal trench in the eastern part of the site (see Figure III.1). These samples were analyzed for the 15 indicator parameters (methylene chloride, chloroform, carbon tetrachloride, benzene, toluene, chlorobenzene, 1,1,2-trichloroethane, tetrachloroethene, 1,1,2,2-tetrachloroethane, trichloroethylene, trichlorobenzene (and isomers), dichlorobenzene (and isomers), hexachlorobutadiene,

total organic halogens, and pH). The procedure for collecting the samples is discussed in Appendix A. The results of these analyses are presented in Appendix D.

Step 2 - Site Investigation

Geophysical Survey (east end) - Resistivity and magnetometer surveys were performed in late May 1984 to define the boundaries and depth of the disposal trench, to identify the presence of buried metal objects, to provide stratigraphic information, and to evaluate the presence of a contaminant plume. Prior to the survey, standing water was drained from the site in order to provide access for the field team.

The magnetic survey of the Nash Road site was conducted using a 40-foot grid pattern over the entire site. A north-south orientation was used on the traverses across the site. The magnetic base station was located offsite in a wooded area west of the site.

The electrical resistivity (ER) survey of the Nash Road site was conducted using both soundings and profiles. Soundings were conducted first to a depth of 100 feet in order to interpret geologic and stratigraphic features. Other soundings were conducted to a depth of 30 feet and others only as deep as necessary to distinguish lenses of interest. Profiles were conducted at electrode spacings of 10, 20, 30, 50, and 70 feet. Figure III.2 shows the location of the ER sounding and profile

stations. Field procedures are outlined in Appendix A. Magnetometer, sounding, and profile field data are included in Appendix C.

Groundwater Monitoring -- A network of five deep and two shallow groundwater sampling wells was installed in June 1984. The locations of the wells were chosen to provide information about the geology of the subsurface and the groundwater flow regime at the entire Nash Road Landfill (see Figure III.1). Soil was drilled and sampled from the ground surface to the top of the bedrock. Stainless steel wells were installed with filter sand packs, and primary and secondary bentonite seals.

Each well was logged visually during drilling and later with a downhole gamma logging unit. Additionally, aquifer characteristics were evaluated by means of in-situ falling head permeability tests and routine water level measurements. To further characterize the lithology of the site soils, a grain size analysis of each soil unit was performed in the laboratory, according to ASTM D-422-63.

Groundwater samples were taken in July 1984 from the seven sampling wells and from a nearby unused residential well. Groundwater samples were analyzed for the 15 indicator parameters; the chemical analytical results were not available as of the writing of this draft report, but will be provided to NYSDEC in the final Phase II report. All field procedures are detailed in Appendix A. Boring logs and well schematics and

grain size analyses are included in Appendix B. Gamma logs are shown on Figures IV.16 and IV.17.

Sediment Sampling – Sediment samples were collected in July 1984 at three locations in the western part of the site, as shown on Figure III.1. It was originally planned that surface water would also be collected at these locations, but no surface water was present on this end of the site. Locations of the sampling points are along the western and northern margins of the site and were chosen to complement the earlier surface water sampling network and to provide information about offsite surface movement of contaminants in a westerly and northerly direction. Sediments are being analyzed for Pb, Cr, Cu, Cd, CN, Hg, Ni, Zn, and organic priority pollutants. Again, chemical analytical results will be presented in the final Phase II report.

Air Survey – An HNU meter survey was performed during July 1984 to evaluate the presence of organic vapor contaminants. No contamination was detected. The procedure for this survey is described in Appendix A. Field data is presented in Appendix D.

TABLE III.1

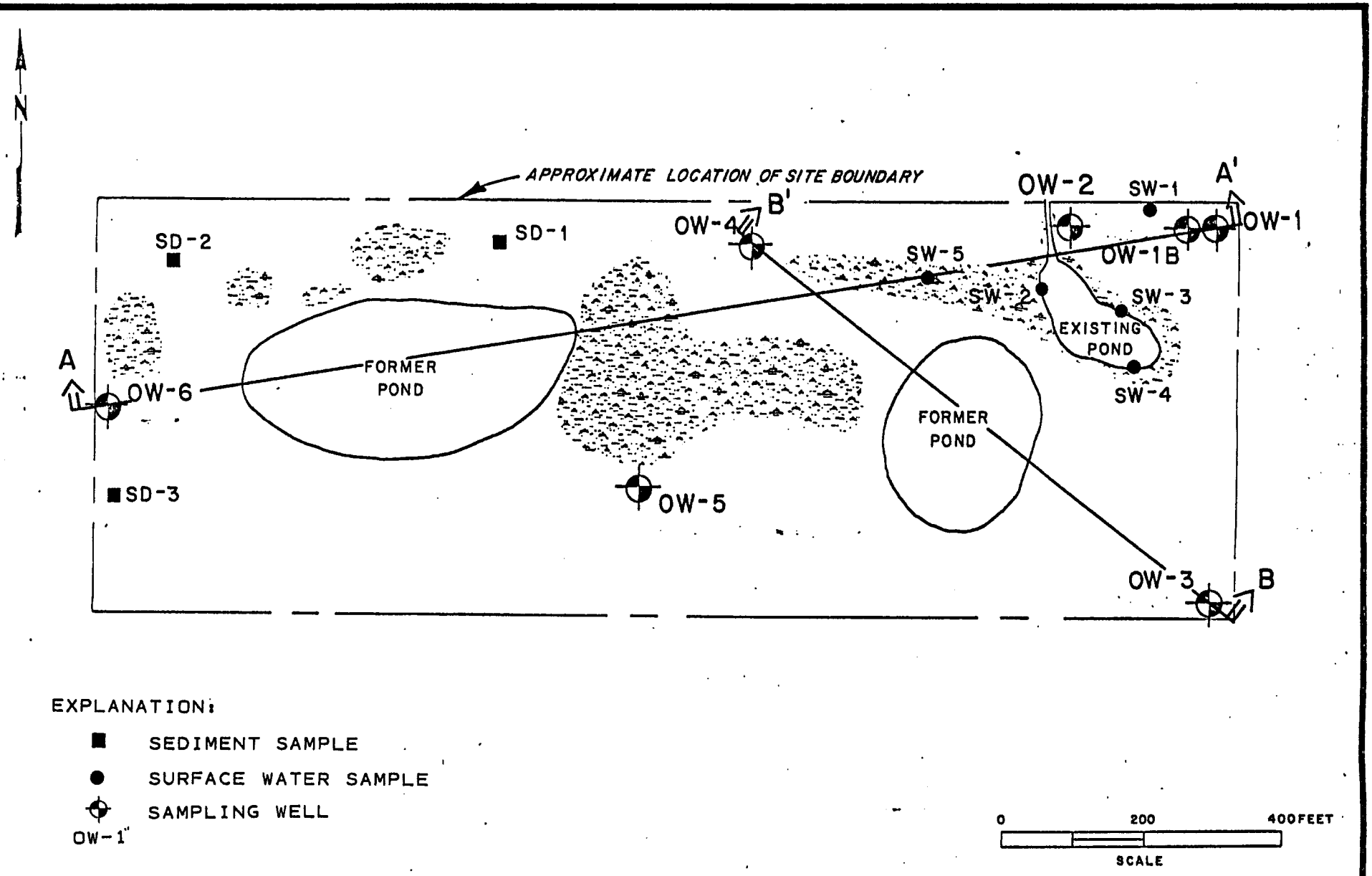
WORK PLAN – TASK DESCRIPTION
(as implemented)
NIAGARA SANITATION, NASH ROAD

TASKS	DESCRIPTION OF TASK
Step 1 – Emergency Evaluation	
Perform Surface Water Sampling and Analyses	Inspect the site and collect 5 water samples around the disposal trench. Analyze the samples for methylene chloride, chloroform, carbon tetrachloride, benzene, toluene, chlorobenzene, 1,1,2-trichloroethane, tetrachloroethene, 1,1,2,2-tetrachloroethane, trichloroethene, trichlorobenzene (and isomers), dichlorobenzene (and isomers), hexachlorobutadiene, total organic halogens and pH.
Step 2 – Site Investigation	
II-A Update Work Plan	Review the information in the Phase I report, and Step 1 evaluation, and revise the Phase II work plan.
II-B Conduct Geophysical Studies	Conduct EM and resistivity to define the boundary and depth of the disposal trench and to provide hydrogeological information.
II-C Conduct Boring/Install Monitoring Wells	Install 7 stainless steel sampling wells.
II-D Construct Test Pits/ Auger Holes	No further construction of test auger holes necessary.
II-E Perform Sampling and Analysis Soil samples from borings	Collect samples during drilling at 5-foot intervals or at changes in subsurface lithology. Perform grain size analysis of each lithologic unit on site.
Soil samples from surface soils	No further sampling necessary.
Soil samples from test pits and auger holes	No further sampling necessary.

TABLE III.1 (cont.)

TASKS		DESCRIPTION OF TASK
	Sediment samples from surface water	Collect 3 sediment samples at the west end and analyze samples for Pb, Cr, Cd, Cu, CN, Hg, Ni, Zn, and a GC/MS organic priority pollutant scan.
	Groundwater samples	Collect samples from the 7 new monitoring wells and analyze for the parameter listed in Step 1.
	Surface water samples	No water at west end of site at time of investigation.
	Air samples	Using the HNU, determine if organic vapors are present.
	Waste samples	No further sampling necessary.
II-F	Calculate Final HRS	Revise HRS based on the field data collected in Tasks IIB-IIE, complete the HRS form.
II-G	Conduct Site Assessment	Prepare final report containing Phase I report, additional field data, final HRS and HRS documentation records, and site assessments. The site assessment will consist of a conceptual evaluation of alternatives and a preliminary cost estimate of the most probable alternative.
II-H	Project Management	Project coordination, administration and reporting.

BY D. Tomes DATE 8/3/84



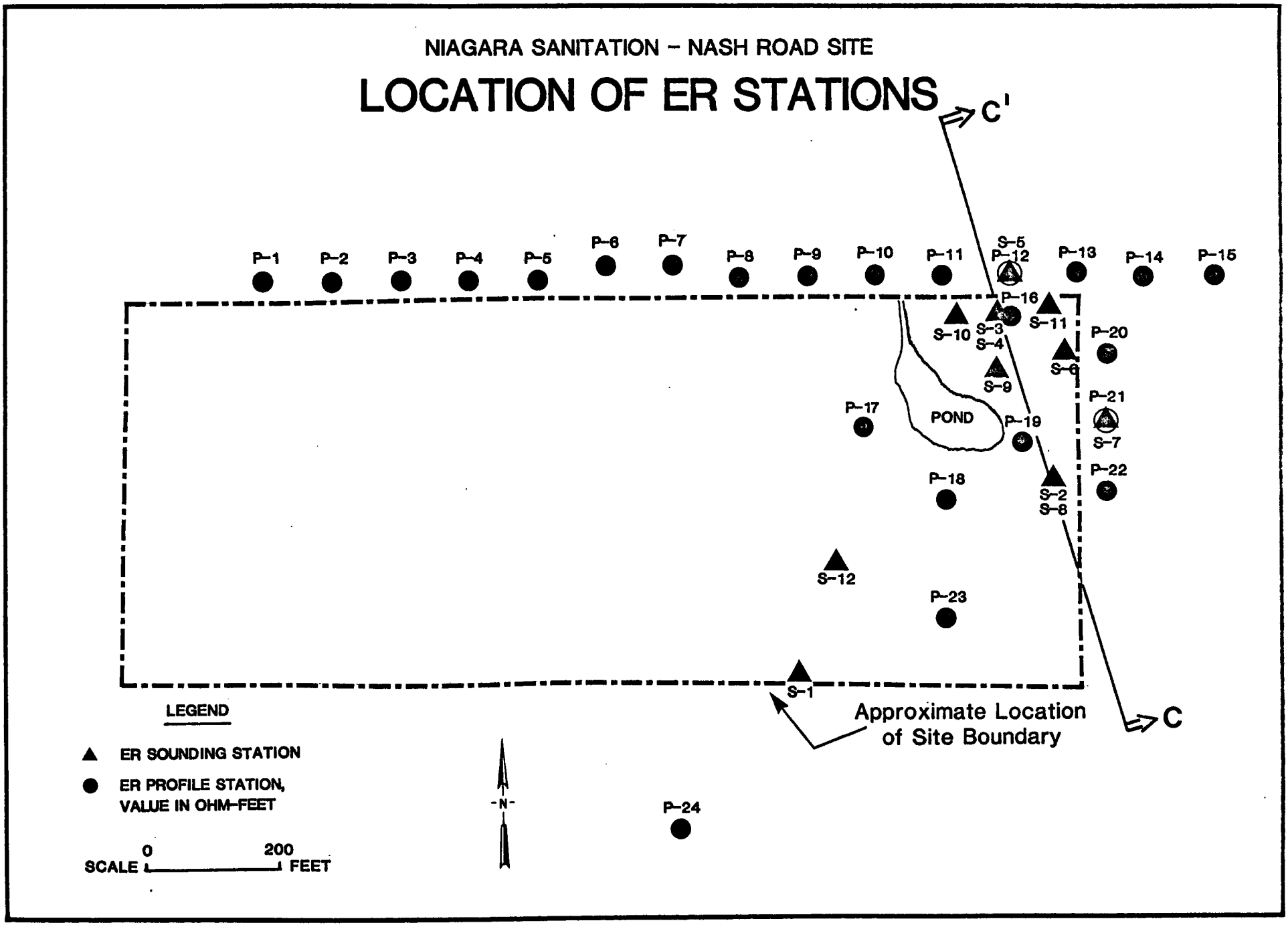
PLOT PLAN
SHOWING CROSS SECTION LOCATIONS
NASH ROAD SITE

DAMES & MOORE

FIGURE III.1

NIAGARA SANITATION – NASH ROAD SITE

LOCATION OF ER STATIONS



ES ENGINEERING-SCIENCE

FIGURE III.2

SECTION IV

SITE ASSESSMENT

Site Topography

The site is an inactive landfill located in the Town of Wheatfield, Niagara County, adjacent to the North Tonawanda City boundary. The site is a rectangular area, seven acres in size. It is surrounded by a suburban residential area, and is partially overgrown with trees and marsh vegetation. Dirt roads provide access to and within the site.

The landfill is visible to many of the residential neighbors south of the site. It is used by nearby residents as a jogging area, dirt bike track, and general play area.

Access to the site is open and unguarded. National Fuel Gas Corporation has a facility adjacent to the western border of the site. A gas pipeline, a salt-brine pipeline, and above-ground electrical lines also pass through the site along the southern boundary.

Before dumping began, the site was a swamp area with surface water drainage to the north toward Sawyer Creek. General surface topography is shown on Figures IV.1 and IV.2. Dumping of wastes and excavation of a disposal trench has resulted in irregular ground surface topography. Relief on the site is greater than 10 feet.

The volume of onsite surface water fluctuates seasonally. In the

spring, approximately one-third of the site is underwater; in late summer, only a few of the deeper (~10 ft) ponds remain. The northern margin of the site is bounded in most parts by a ditch, which, in the spring, contains surface water. The large ponds and the disposal trench drain into this ditch.

During our field activities in May through July, 1984, abundant wildlife was observed on the site, including birds, rabbits, frogs, turtles. No human use of surface water was observed. Groundwater is similarly unused, although an older home adjacent to the site has a (unused) residential water well. It is possible that other older homes in the vicinity of the landfill have residential wells. (Niagara Co. Dept. of Health is unaware of any other existing wells.) All nearby residents presently are supplied with municipal drinking water.

Site Hydrogeology

Regional Geology

The Nash Road Site is located in the Erie-Ontario Lowlands physiographic province. The bedrock of this region is predominantly limestone, dolostone, and shale.

In the recent past, most of New York State, including the site, has been repeatedly covered by a series of continental ice sheets. The activity of the glacier widened preexisting valleys and deposited widespread accumulations of till. The melting of ice, ending approximately 12,000 years ago, produced large

volumes of meltwater; this water subsequently shaped channels and deposited thick accumulations of stratified, granular sediments.

As glacial ice retreated from the region, meltwater formed lakes in front of the ice margin. This region is covered by lake sediments, the most recent being from Lake Tonawanda, an elongate lake which occupied an east-west valley and drained north into Lake Iroquois. The sediments consist of blanket sands and beach ridges which are occasionally underlain by lacustrine silts and clays.

Granular deposits in this region frequently act as shallow aquifers, whereas lacustrine clays, as well as tills, often inhibit groundwater movement. However, fine-grained, water-lain sediments, such as silts and clays, frequently contain horizontal laminations and sand seams. These internal features facilitate lateral groundwater movement through otherwise low permeability materials.

Site Geology

This analysis is based on subsurface information from the drilling program, downhole gamma logging and geophysical surveys and sounding of the site. Also used in this analysis were the USGS shallow borings made in 1982.

Bedrock is Lockport Dolostone, occurring at depths varying from 65 feet to 71 feet below the ground surface. The surface of the bedrock slopes approximately to the north (Figure IV.3) and forms

a north-trending channel in the center of the site. An ER profile of the 70-foot deep surface (Figure IV.4) resulted in electrical values indicative of bedrock. Values south of the disposal trench, as seen on Figure IV.4 and all ER profiles are numerically lower and suggest a wet area.

A till unit is located immediately above the bedrock surface. The till is a pink, very dense, silt and gravel with some sand. Grain size analyses show silt contents as great as 65%. Gravel size increases to the west. The till blankets the site with an average thickness of 25 feet. The 50-foot deep surface, which occurs within the till, has been mapped with ER profiling (Figure IV.5). The values are relatively consistent, except again for the low values south of the disposal trench. The top surface of the till, as shown on Figure IV.5, forms a channel trenching northwest, with a maximum relief across the study area of 17 feet.

Overlying the till is a lower sand unit. A grain size analysis of the unit indicates that it is a fine sand with approximately 35% silt. This sand unit does not blanket the site, but rather occurs as a wedge-shaped unit, thickening to the north-center part of the site (Figure IV.7). At the western and eastern margin of the site, the sand unit has a thickness of less than one foot. An ER profile map of the 30-foot deep surface (Figure IV.8), which corresponds approximately with the depth of the lower sand, shows lower values south of the trench. Again, these

can be interpreted as an increased water content of the soils in this area. Based on its lithology and stratigraphic position, this sand unit is interpreted to be an early deposit of Lake Tonawanda.

Above the lower sand and blanketing the site is a layered "fat" clay unit which grades vertically into a layered silty "lean" clay. Both of these units contain numerous sand seams. Hydrometer analyses of these fat and lean clays confirm the vertically increasing silt content. These clay units are classic examples of Lake Tonawanda deposits, as mapped by Muller (1977). The most likely mineralogy for the clay minerals is illite. Two ER profile maps of the 20-foot ddep and 10-foot deep surfaces (both of which are within this clay unit) show, again, an area south of the trench with distinctly low resistivity values. This again is interpreted as the result of increased water content. Contours on the top surface of the upper clay unit, as shown on Figure IV.11, show a surface sloping gently north and west; maximum relief is 3 feet.

An upper sand unit is located immediately above the clay unit, in all parts of the site except in the northeast corner. This sand unit varies in thickness from greater than 8 feet in the southwest to 0 feet in the northeast (Figure IV.12). A grain size analysis of this unit indicates a fine sand with approximately 20% silt. This unit probably originated as a late deposit of Lake Tonawanda.

In the eastern part of this site, the upper sand is overlain by a layered silt. A grain size analysis of this silt shows that it contains approximately 20% sand and little clay. During testing, a suspension of this silt was extremely frothy and had a soapy odor. The occurrence of this fine-grained unit suggests a possible deepening of the Lake Tonawanda water.

The uppermost unit on the site is a mixed sand/waste fill. This unit is defined best from the results of the magnetomert survey. Readings on the site were highly variable due to the disturbed soil, landfill type debris and buried metallic objects. On Figure IV.13, the areas of very high magnetic readings (greater than 58,000 gammas) are interpreted as buried ferromagnetic metal objects. The magnetic readings of 57,500 gammas are interpreted as disturbed soil areas and possibly buried ferromagnetic metal objects.

The magnetic data indicates that there are five areas on the landfill that may be underlain by buried ferromagnetic metal objects. The data also suggest that the landfill has several distinct areas of disturbed soil, i.e., pits and/or trenches, and mixed soil/waste fill. Samples taken during drilling support this interpretation.

The stratigraphic relationship between the units can be seen on the cross sections prepared from boring logs (Figures IV.14 and IV.15). The locations of these lines are shown on the Plot Plan

(Figure III.1). The sand/waste mixed fill covers part of the ground surface and is underlain by the upper sand or the clayey silt. In virgin areas, the ground surface is either silt or sand. Excavation of the disposal trench, not shown on the cross section, would have exposed the fat clay in the base of the trench.

Cross sections have also been prepared based on gamma log records (Figures IV.16 and IV.17). These cross sections show the same stratigraphy as those based on boring logs, as well as some finer detail and time lines. For example, peaks A and B are on approximately horizontal lines suggesting site-wide thin sand seams within the lacustrine clay. Similarly, peak C corresponds to the occurrence of the lower sand unit and peak E to the upper sand and sand/waste fill units. It should be noted that the gamma log responses of the upper sand unit and the fill/sand unit are the same due to the presence of the sand. These units are plotted together on the gamma log cross sections.

A cross section based on ER sounding values has been prepared and is shown on Figure IV.18. The location of this cross section line is shown on Figure IV.19. On the cross section, all lithologic units are discernable. In addition, a 3-foot thick "wet zone" is indicated between depths of 16 feet and 26 feet, sloping to the north. This ER peak corresponds roughly with the depths of peak B on the gamma log cross sections and therefore may indicate a silt or other low gamma count density material. Boring logs (OW-1 and OW-3) show this depth range to be a very

soft wet clay. This anomaly is of particular interest to the study because it coincides with the approximate depth of the disposal trench.

Hydrology

To date, the hydrology of the Nash Road site is known from in-situ permeability tests, groundwater elevation measurements, limited chemical information, and our interpretations from the subsurface geology.

Surface Water Hydrology

The occurrence and location of surface water on the Nash Road site is variable and seasonal. Most surface water bodies occur in small enclosed depressions, less than 3 feet deep. They are formed by either snow meltwater or rainwater and generally disappear, due to evaporation, during the summer months. Water in these ponds was observed to be either clear or rust-colored. Most of these ponds are rimmed with marsh-type vegetation. Due to their temporal and enclosed nature, no water samples were taken in these ponds.

In contrast to the small ponds, several large connected ponds and the disposal trench are located in the northeast section of the site and contain water year-round. The color of this water is clear, with occasional patches of green floating algae and weeds. The edges of these ponds are rimmed with marsh-like vegetation. Numerous barrels and other debris can be seen floating in these

ponds. Local children reported to our field team that these ponds do not freeze in the winter. In the spring and early summer, these ponds drain into a ditch along the northern margin of the site. Water samples from these ponds and from the ditch were analyzed in July 1983, as an emergency measure to see if any contamination was leaving the site via surface water. The results of these analyses are shown on Table IV-1. Although all indicator parameters were tested, only total organic halogens and methylene chloride were found. It is interesting to note that the ditch water sample had slightly greater levels of contamination than any of the other pond and trench samples. This may indicate an additional water source to the ditch either west or north of the site. It should be noted that these chemical analyses were performed without complete quality assurance procedures due to the emergency response nature of this part of the study.

Groundwater Hydrology

Permeabilities for the various screened units are shown in Table IV.2. The magnitudes of the values are typical of the corresponding soil lithologies. The till/bedrock interface permeability is variable, depending upon the degree of fracture of the bedrock and the sand and gravel content of the till.

The piezometric surface within the till is mapped on Figure IV.20. The configuration of the contours suggests a groundwater high beneath the center of the site. This high may be attributable to the occurrence of the lower sand unit,

TABLE IV.1

848J31/36330

Analytical Results for Surface Water Samples

Parameter	SW-1	SW-2	SW-3	SW-4	SW-5
Methylene Chloride, ug/l	11	<10	10	<10	<10
Chloroform, ug/l	<10	<10	<10	<10	<10
Carbon Tetrachloride, ug/l	<10	<10	<10	<10	<10
Benzene, ug/l	<10	<10	<10	<10	<10
Toluene, ug/l	<10	<10	<10	<10	<10
Chlorobenzene, ug/l	<10	<10	<10	<10	<10
1,1,2-trichloroethane, ug/l	<10	<10	<10	<10	<10
Tetrachloroethane, ug/l	<10	<10	<10	<10	<10
1,1,2,2 - tetrachloroethene, ug/l	<10	<10	<10	<10	<10
Trichloroethene, ug/l	<10	<10	<10	<10	<10
Trichlorobenzene (isomers), ug/l	<10	<10	<10	<10	<10
Dichlorobenzene (isomer), ug/l	<10	<10	<10	<10	<10
Hexchlorobutadiene, ug/l	<10	<10	<10	<10	<10
pH	6.9	8.1	7.1	7.4	7.4
Total organic halogens mg/l	0.010	0.005	0.007	0.007	0.008

immediately above the till, acting as a source of recharge for the till.

The thick, soft clay unit above the lower sand may act as an aquitard, thus allowing only lateral recharge of the lower sand unit. Alternately, the clay may be permeable due to its soft (low density) consistency and layered fabric with numerous sand seams (see gamma logs). Additionally, the excavation of the disposal trench removed part of the clay unit and possibly disturbed the clay floor of the trench during the drag-line excavation procedure. This activity may have opened a new flow path by which surface water now may be connected with sand seams in the clay and possibly with the lower sand unit.

The upper sand unit probably forms a shallow perched aquifer, although no wells were placed in this unit. Based on our interpretation of the upper clay unit surface geometry (Figure IV.11), we expect that flow direction within the shallow aquifer to follow the contours of the underlying clay unit. Again, this clay unit has been partially excavated in the trench, thereby providing a connection between the upper aquifer and trench water, and, by extension, possibly into the lower aquifer.

TABLE IV.2

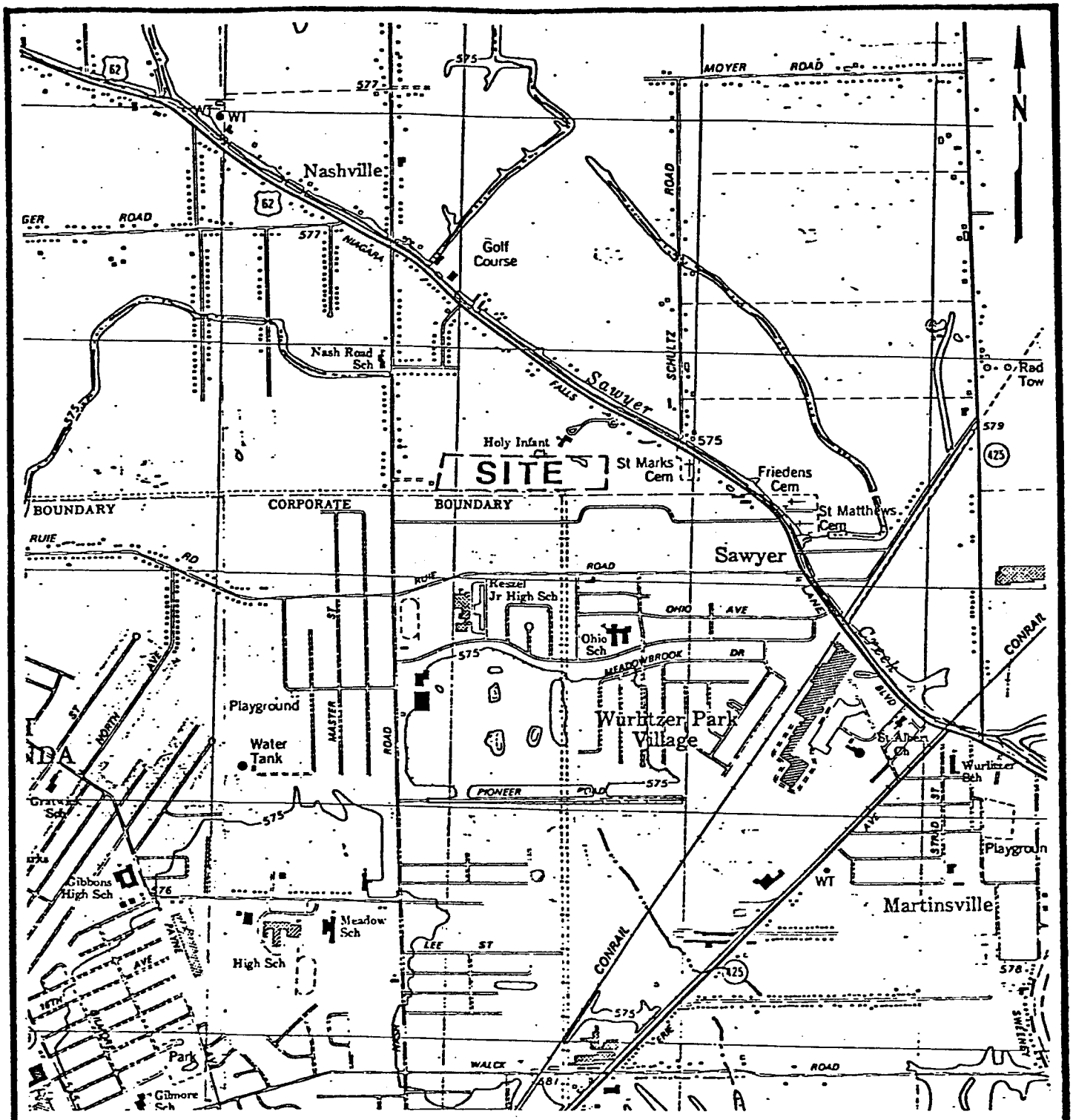
Summary
In-Situ Permeability

Well	Permeability cm/sec	
OW-1	4.37×10^{-4}	silt
OW-2	6.75×10^{-4}	silt and sand
OW-1B	8.43×10^{-7}	till/bedrock
OW-3	1.43×10^{-6}	wet zone in till
OW-4	7.88×10^{-7}	till/bedrock
OW-5	7.5×10^{-4}	till/bedrock
OW-6	6.8×10^{-4}	till/bedrock

Contamination

Analytical results of groundwater and sediment chemistry are not yet available. Therefore, no conclusions can be reached regarding the occurrence or extent of contamination in the surface or subsurface. When these results become available, they will be incorporated with, and interpreted in light of, assessment of site geology and hydrology.

Air quality HNU survey indicated no air contamination.



SITE COORDINATES: 43°04' 10.0" N. LAT
78°51' 33.8" W. LONG

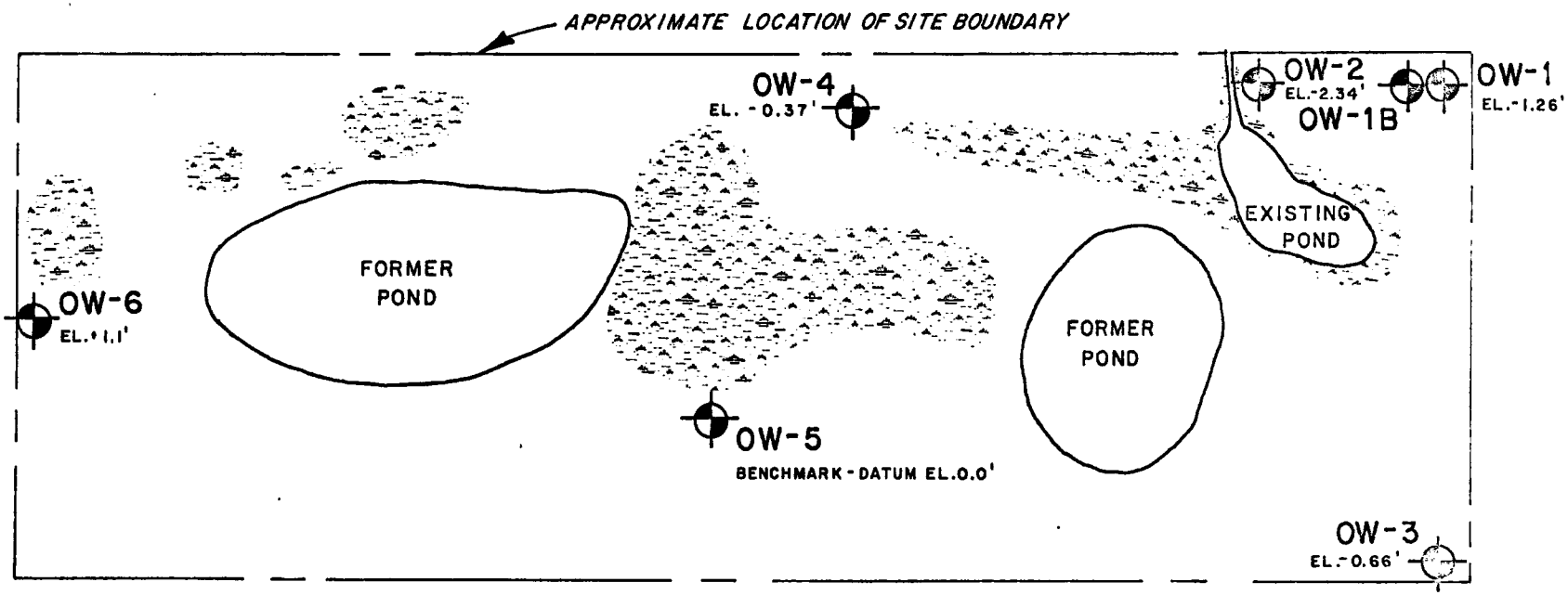
REFERENCE: U.S.G.S. 7.5' TOPOGRAPHIC MAP
TONAWANDA EAST, NY (1980) AND
TONAWANDA WEST, NY (1980) QUADRANGLES

SITE LOCATION MAP
NASH ROAD SITE

DAMES & MOORE

FIGURE IV.1

BY D. Inman DATE 7/25/84



SURFACE TOPOGRAPHY
NASH ROAD SITE

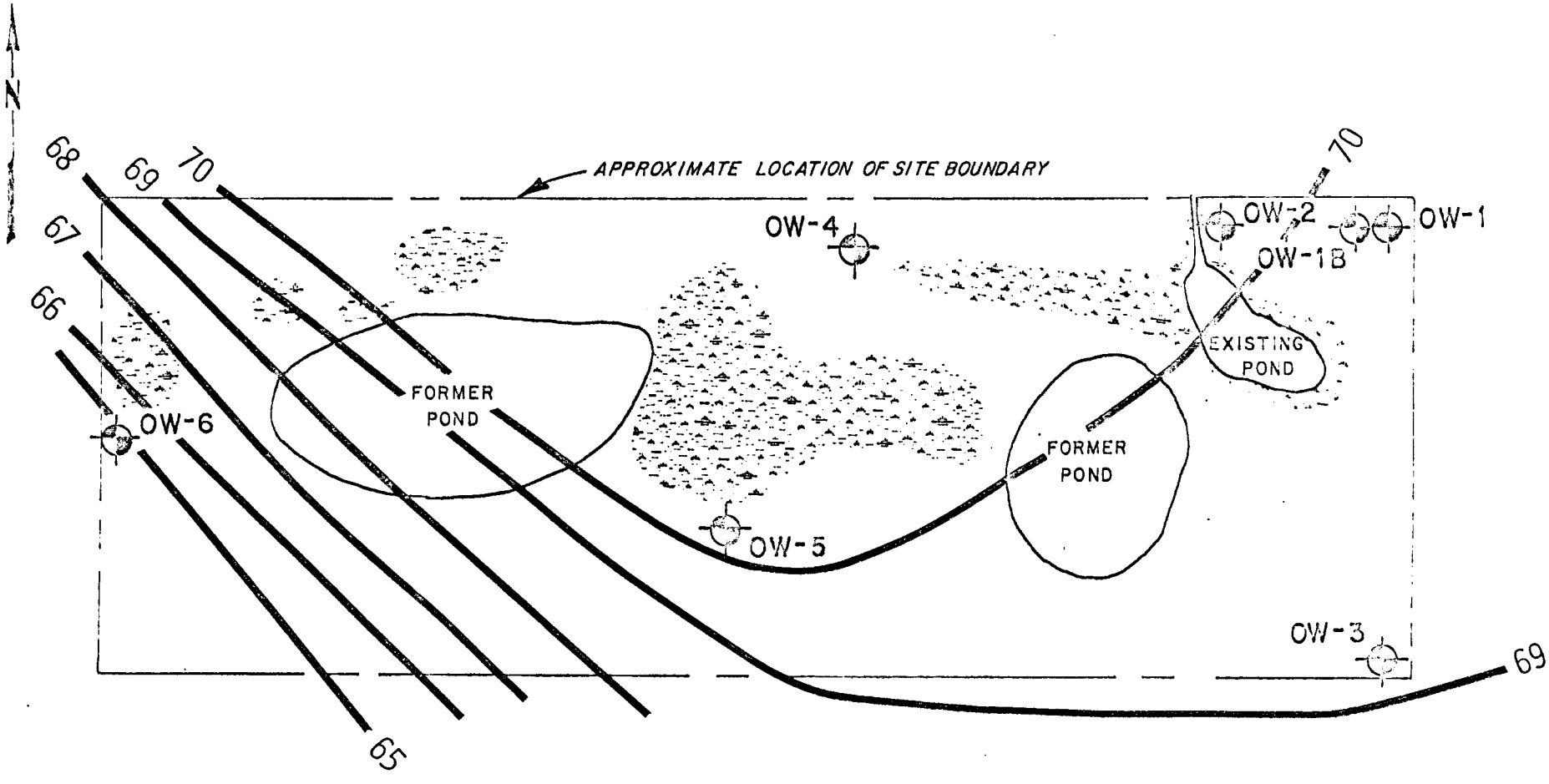
Note: Elevation values in feet relative to arbitrary datum

DAMES & MOORE

FIGURE IV.2

FILE 3305-003/19

BY D. James DATE 7/05/84



DEPTH TO BEDROCK SURFACE
NASH ROAD SITE

Note: Values in feet below arbitrary datum.

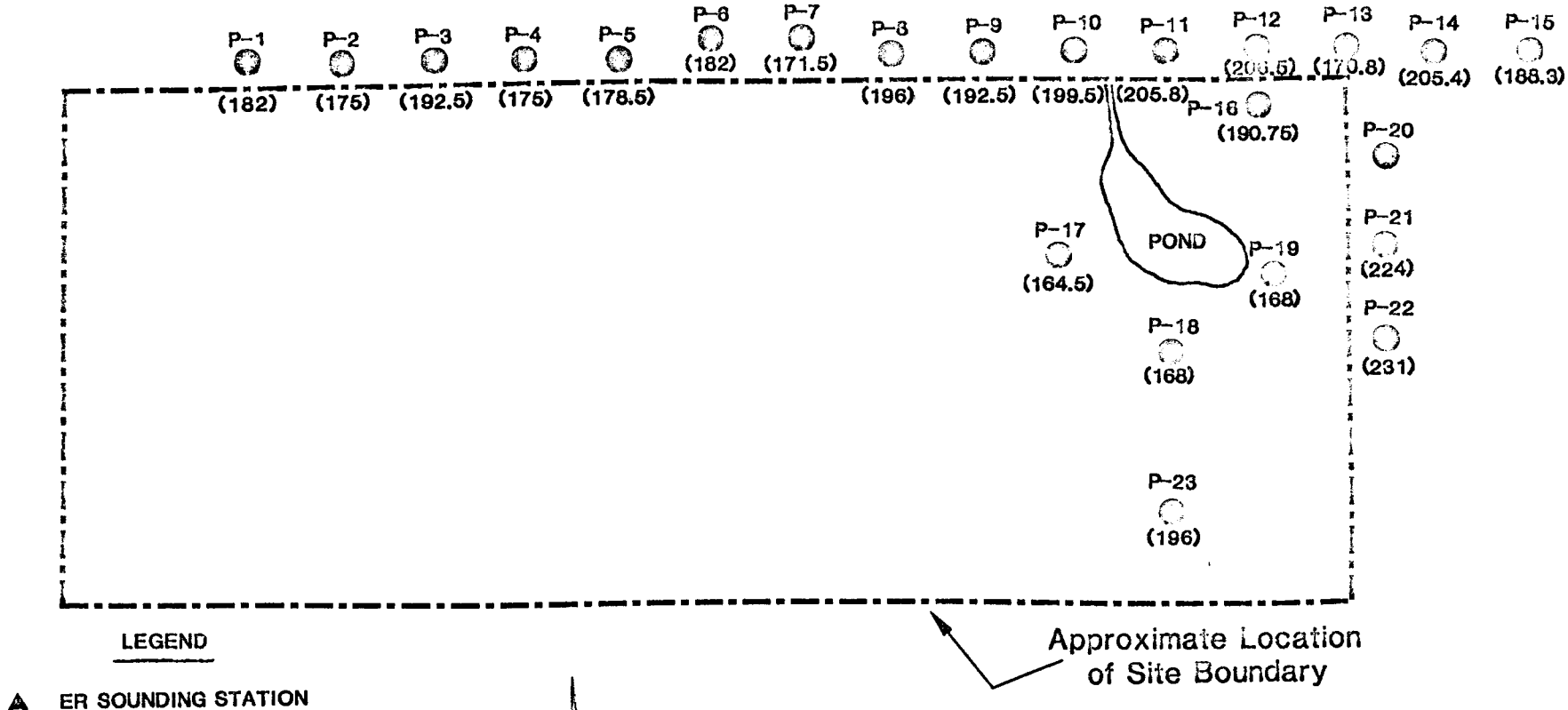
DAMES & MOORE

FIGURE IV.3

NIAGARA SANITATION –NASH ROAD SITE

ER PROFILE MAP

(Electrode Spacing =70 feet)



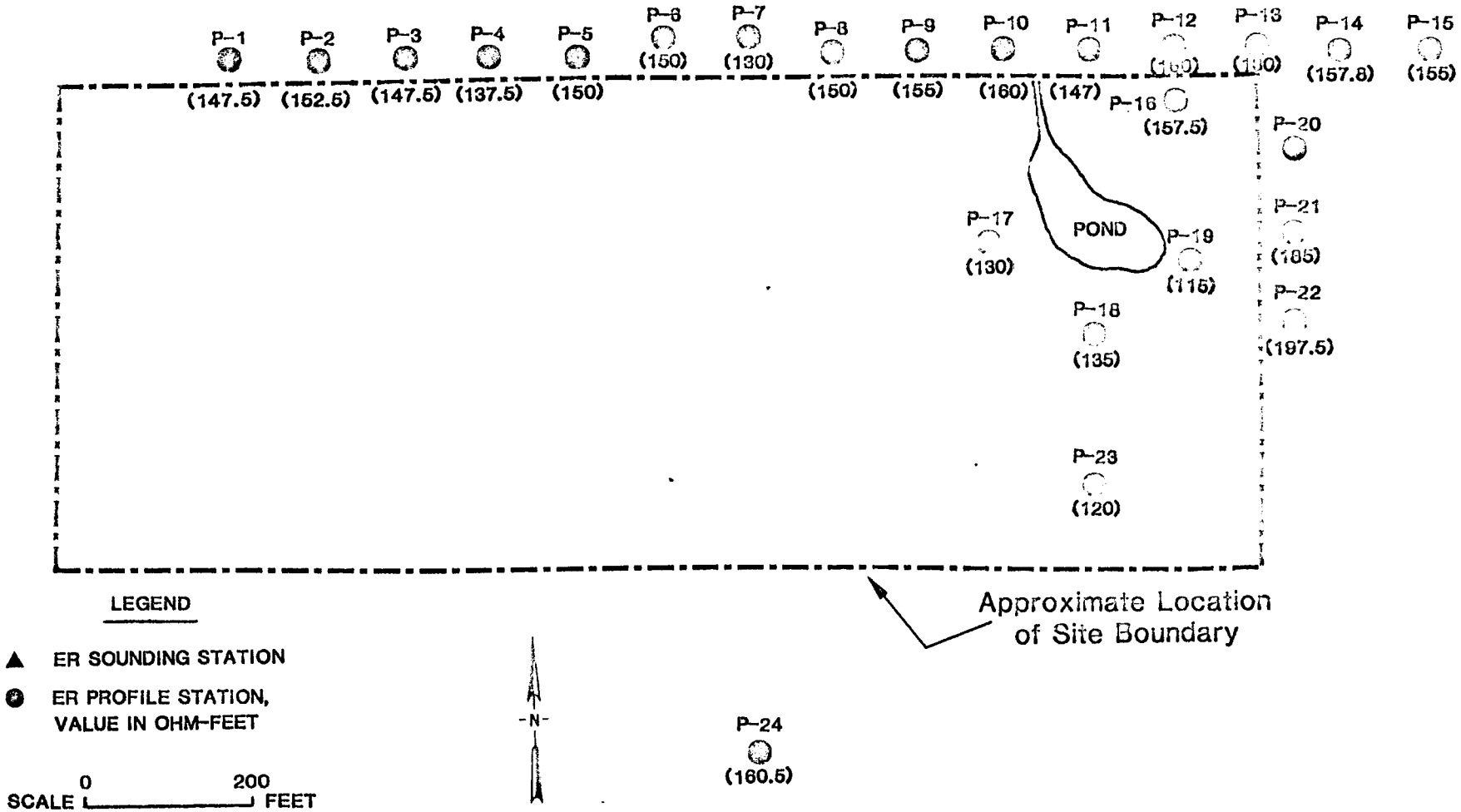
ES ENGINEERING-SCIENCE

FIGURE IV.4

NIAGARA SANITATION -NASH ROAD SITE

ER PROFILE MAP

(Electrode Spacing =50 feet)

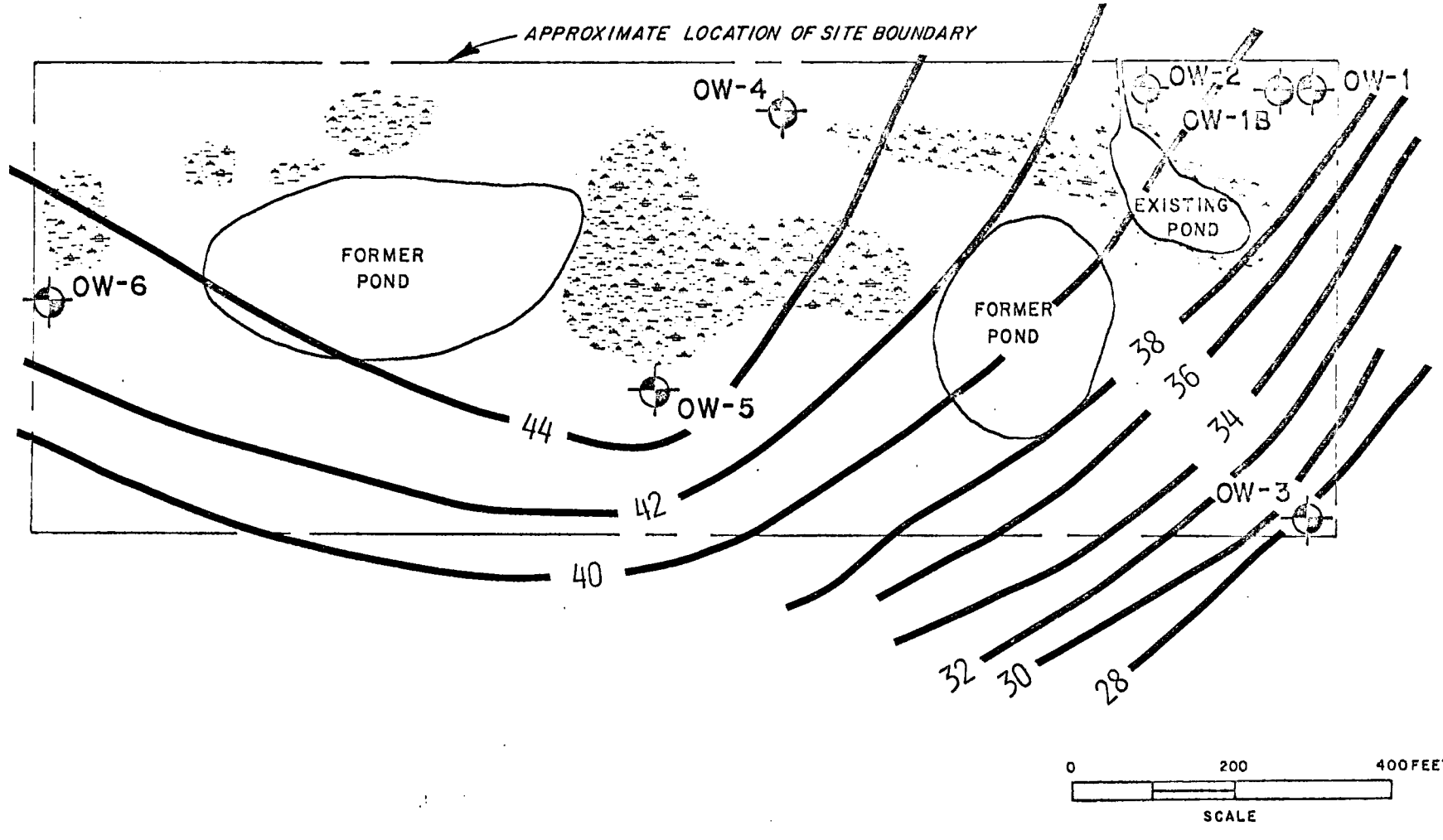


ES ENGINEERING-SCIENCE

FIGURE IV.5

FILE D305.003/19

BY D. Doman DATE 7/25/89



Note: Values in feet below arbitrary datum.

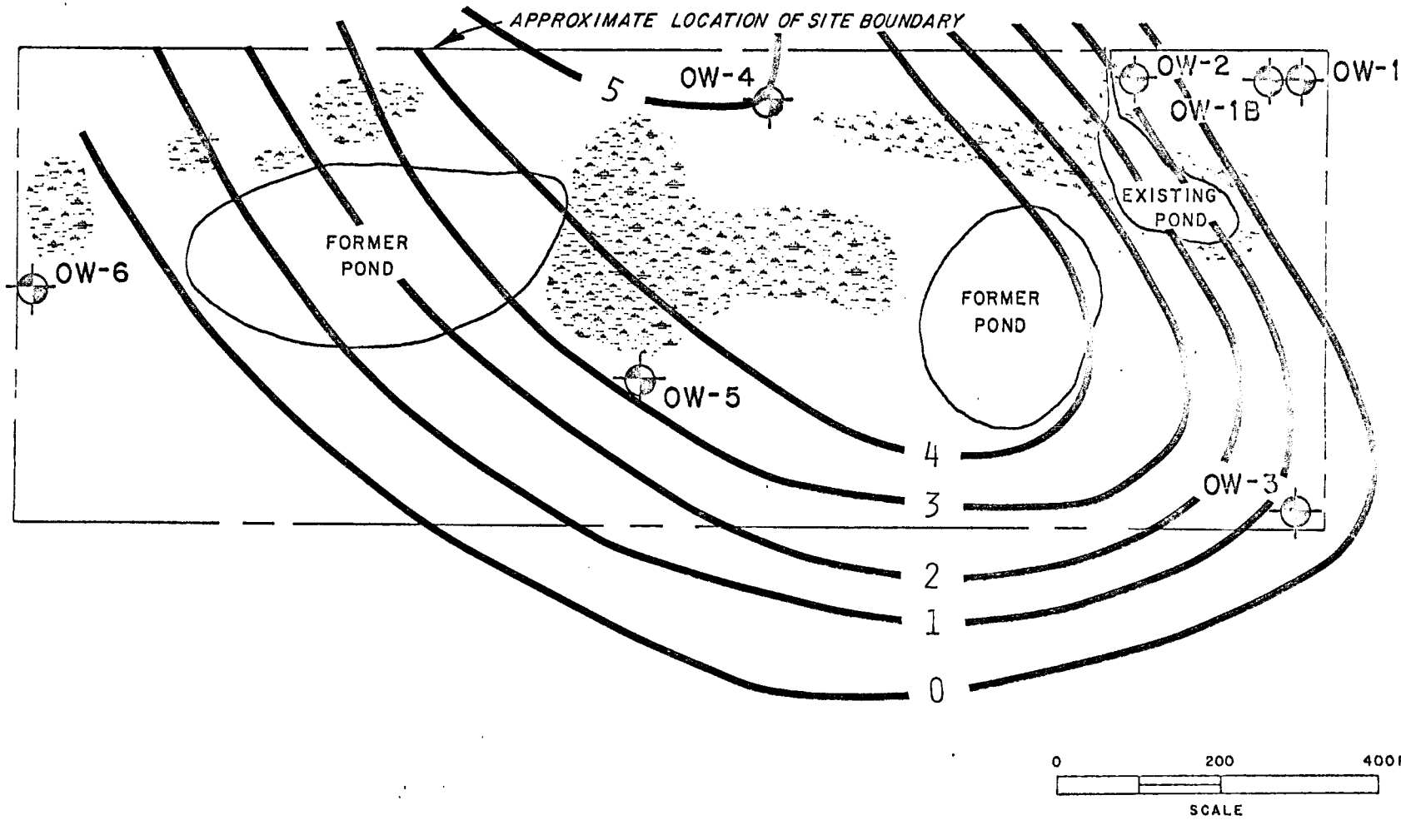
DEPTH TO TOP OF TILL
NASH ROAD SITE

DAMES & MOORE

FIGURE IV.6

FILE 1330S-003/19

BY D. Turner DATE 7/25/84



LOWER SAND ISOPACHS
NASH ROAD SITE

Note: Values in feet

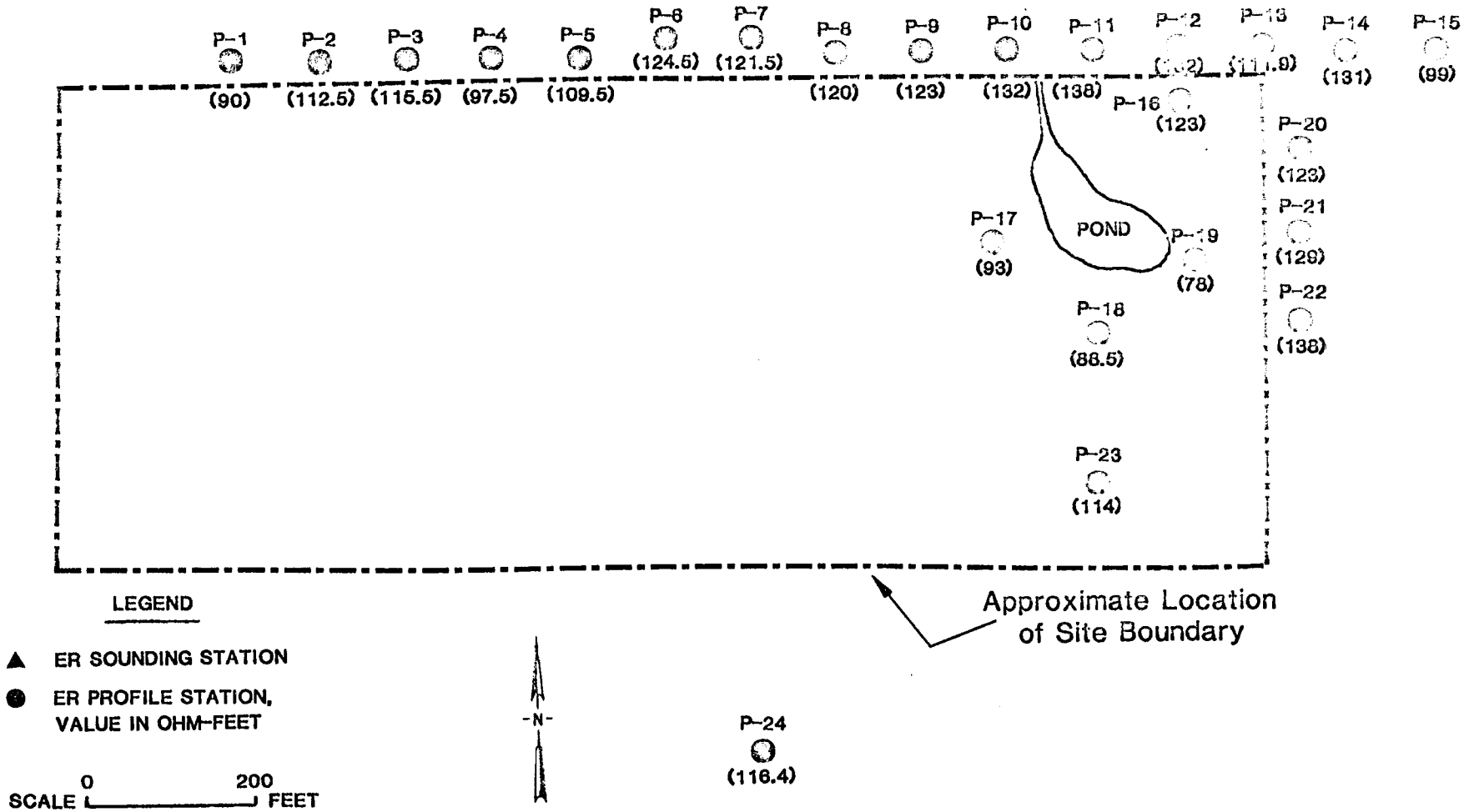
DAMES & MOORE

FIGURE IV.7

NIAGARA SANITATION –NASH ROAD SITE

ER PROFILE MAP

(Electrode Spacing = 30 feet)



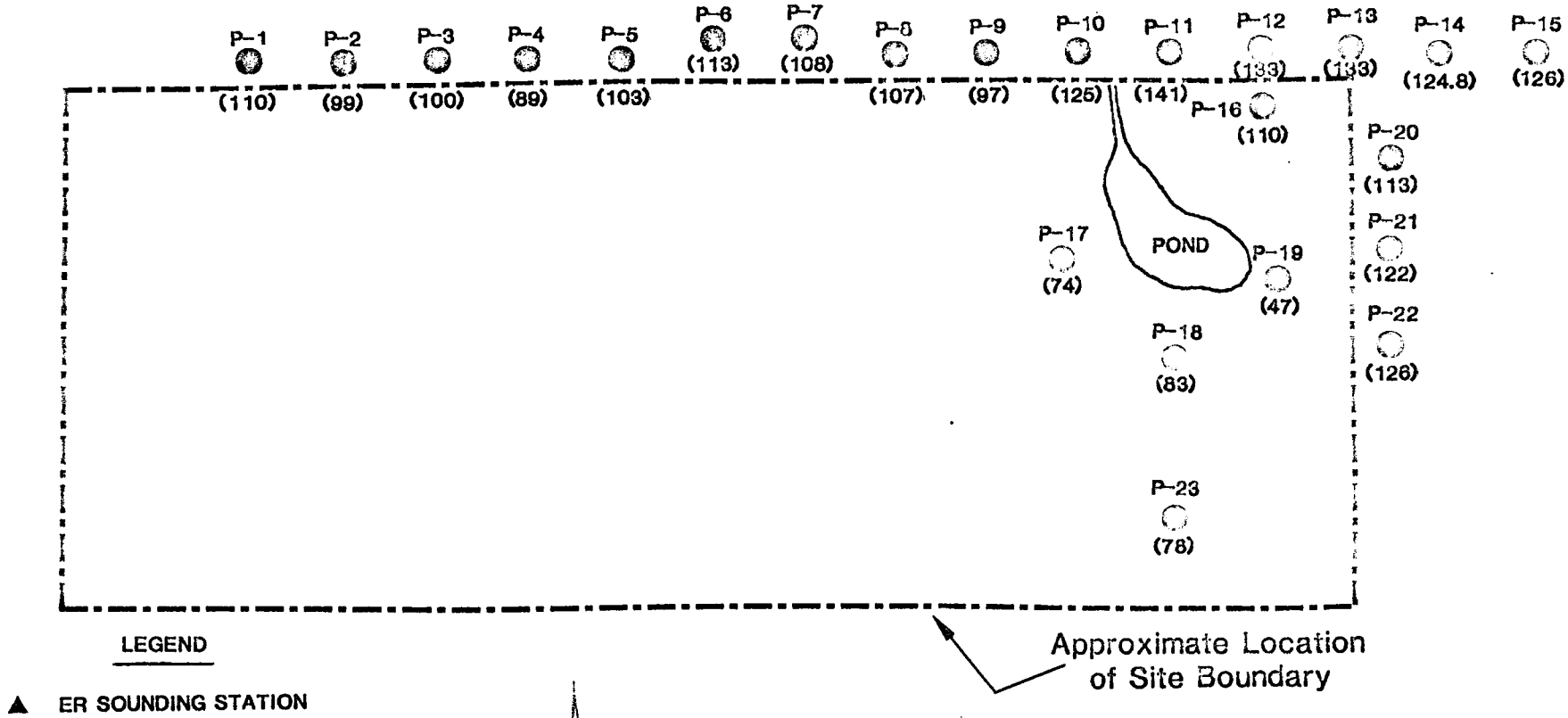
ES ENGINEERING-SCIENCE

FIGURE IV.8

NIAGARA SANITATION -NASH ROAD SITE

ER PROFILE MAP

(Electrode Spacing = 20 feet)



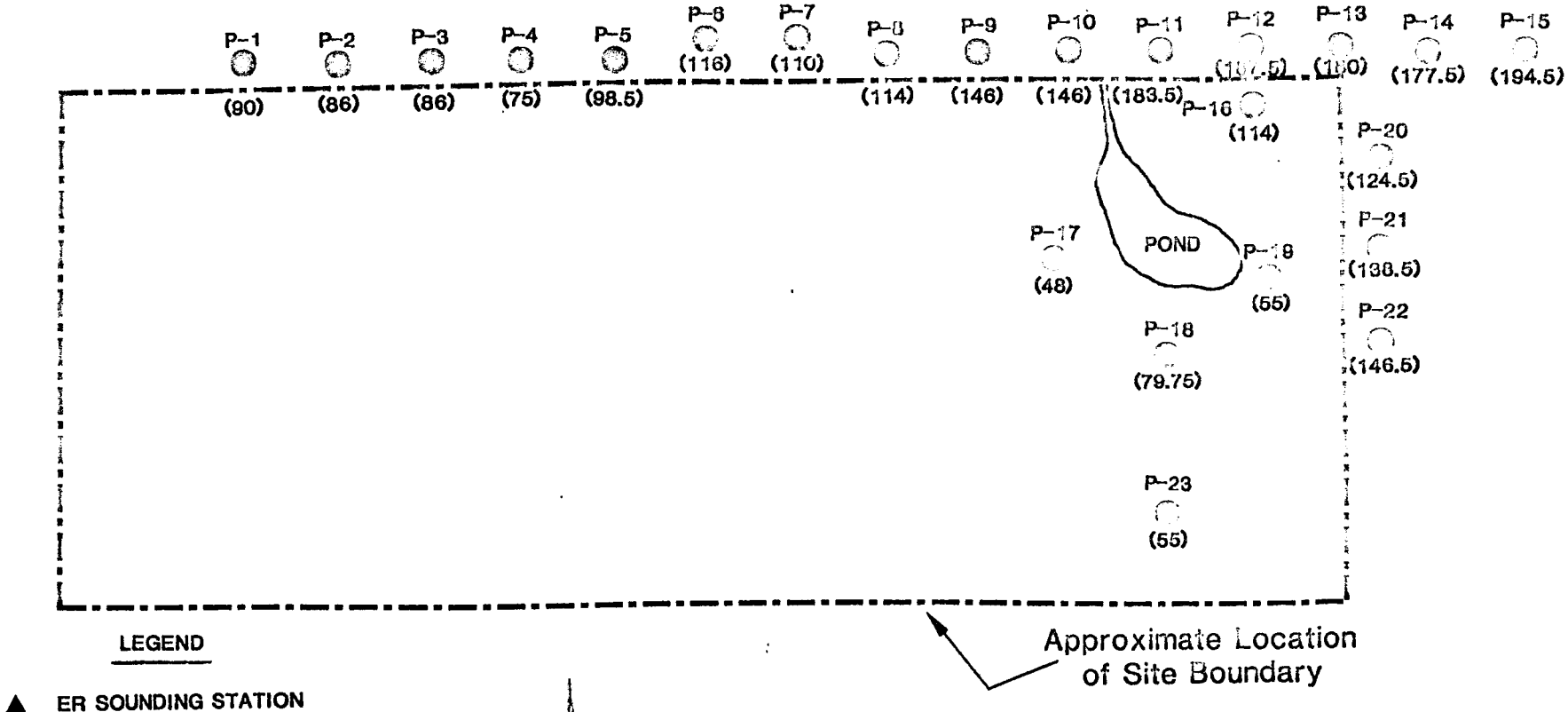
ES ENGINEERING-SCIENCE

FIGURE IV.9

NIAGARA SANITATION –NASH ROAD SITE

ER PROFILE MAP

(Electrode Spacing = 10 feet)

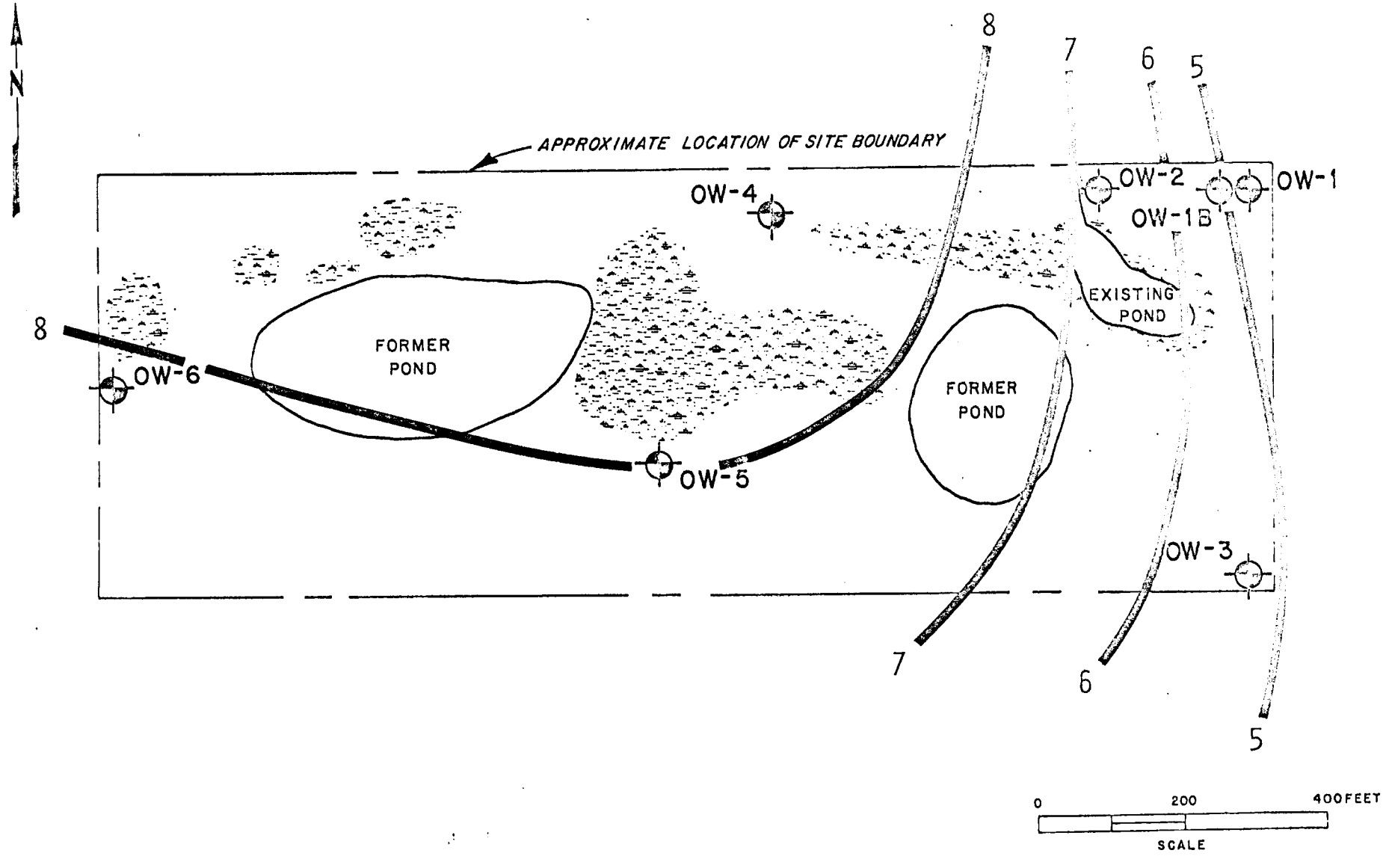


ES ENGINEERING-SCIENCE

FIGURE IV.10

FILE 13305.003/19

BY DeTomaso DATE 7/25/84



DEPTH TO TOP OF UPPER CLAY UNIT
NASH ROAD SITE

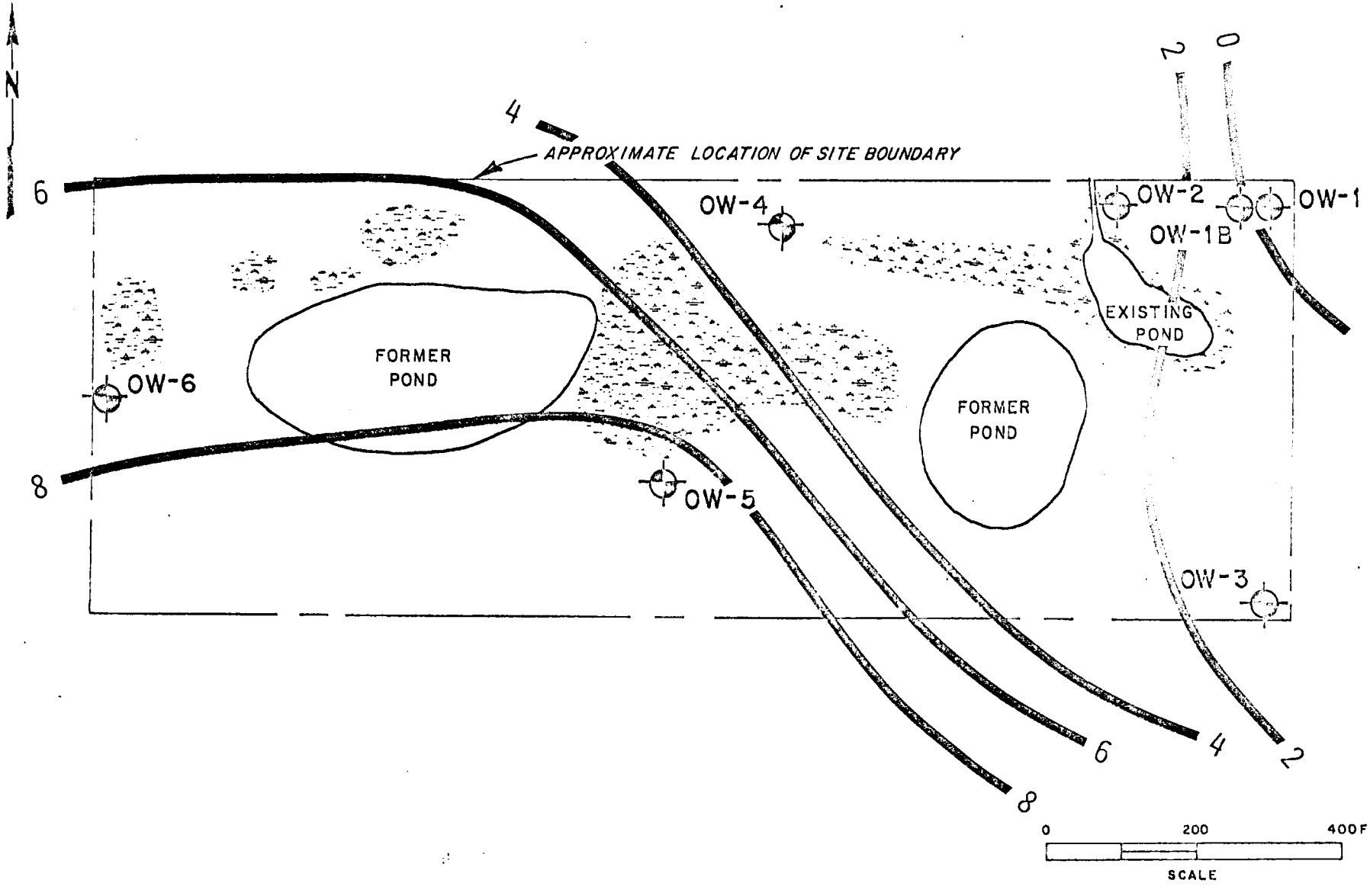
Note: Values in feet below arbitrary datum.

DAMES & MOORE

FIGURE IV.11

FILE 13305-009/19

BY Q. Torres DATE 7/25/84



UPPER SAND ISOPACHS
NASH ROAD SITE

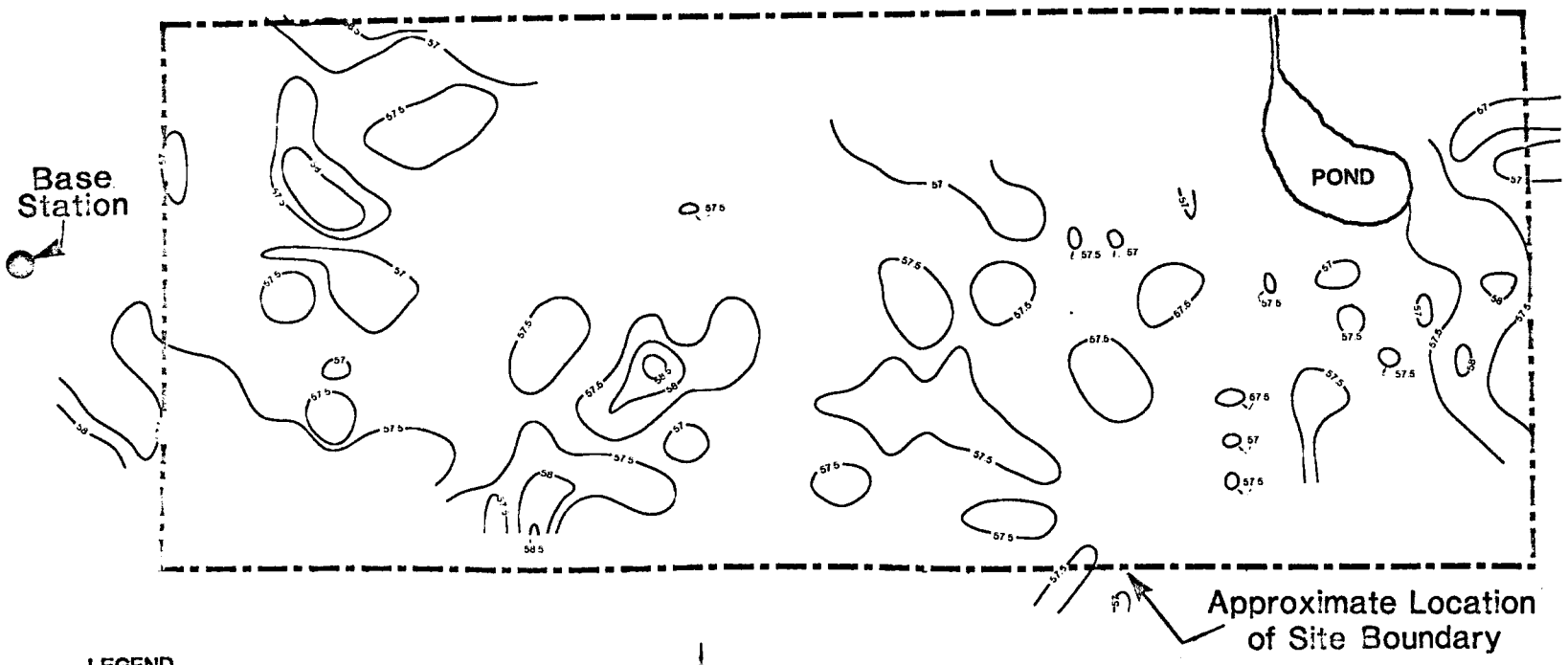
Note: Values in feet

DAMES & MOORE

FIGURE IX.12

NIAGARA SANITATION – NASH ROAD SITE

MAGNETIC CONTOUR MAP



ENGINEERING-SCIENCE

FIGURE IV.13

A

WEST

A'

EAST

OW-6

OW-5 (PROJECTED 280'N)

OW-4 (PROJECTED 100'S)

OW-2 (PROJECTED 30'S)

OW-1

OW-1B

MIXED SAND/WASTE FILL

GRAY WET MEDIUM TO FINE SAND, TRACE SILT

GRAY MOIST LAYERED CLAY

BROWN MOIST SILT, SOME COARSE TO FINE SAND, SOME FINE TO COARSE GRAVEL, TRACE OF CLAY

DOLOSTONE BEDROCK

GRAY AND BROWN MOIST LAYERED CLAY AND SILT

GRAY WET MEDIUM TO FINE SAND, TRACE SILT

SCREENED INTERVAL

DOLOSTONE BEDROCK

GRAY AND BROWN MOIST SILT AND CLAY

DEPTH IN FEET

0

10

20

30

40

50

60

70

0 200 400 FEET

HORIZONTAL SCALE

CROSS SECTION A-A'

DATE 8/6/84

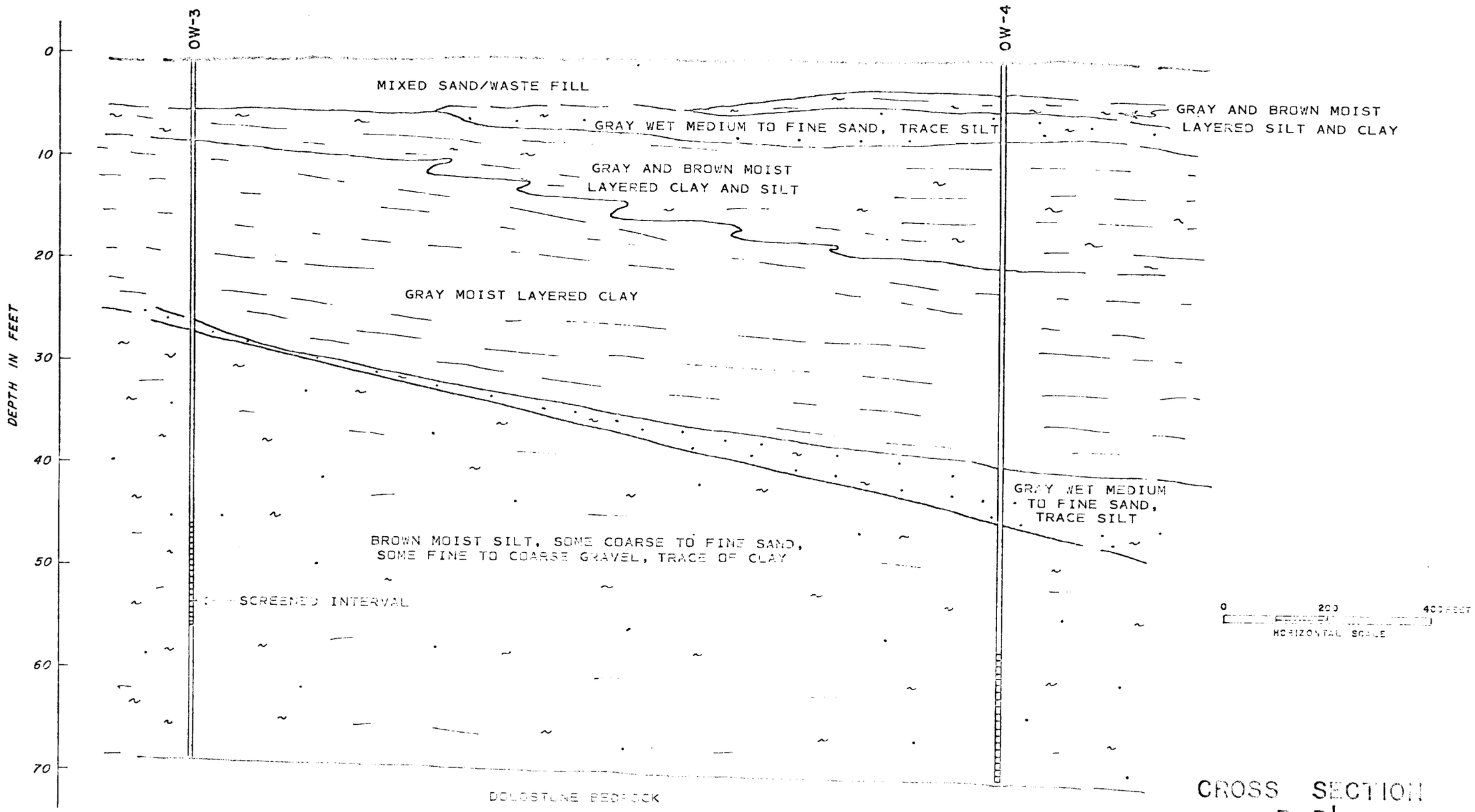
BY: G. Timmerman

B

SOUTHEAST

B'

NORTHWEST



CROSS SECTION
B-B'

DATE 8/4/84

BY O. Jones

A
WEST

A'
EAST

OW-6

OW-5 (PROJECTED 280' N)

OW-4 (PROJECTED 100'S)

OW-2 (PROJECTED 30'S)

OW-1
OW-1B

UPPER SAND
AND
MIXED SAND/WASTE FILL

SILT

LEAN CLAY

FAT CLAY

LOWER SAND

TILL

E

A

B

C

D

APPROXIMATE DEPTH IN FEET

0
10
20
30
40
50
60
70

0 200 400 FEET
HORIZONTAL SCALE

CROSS SECTION A - A'
BASED ON BOREHOLE STRATA LOGS

B
SOUTHEAST

B'
NORTHWEST

OW-3

OW-4

E

E

MIXED SAND/WASTE FILL

LEAN CLAY

FAT CLAY

A

A

B

B

C

C

D

D

LOWER SAND

TILL

APPROXIMATE DEPTH IN FEET

0

10

20

30

40

50

60

70

0 200 400 FEET

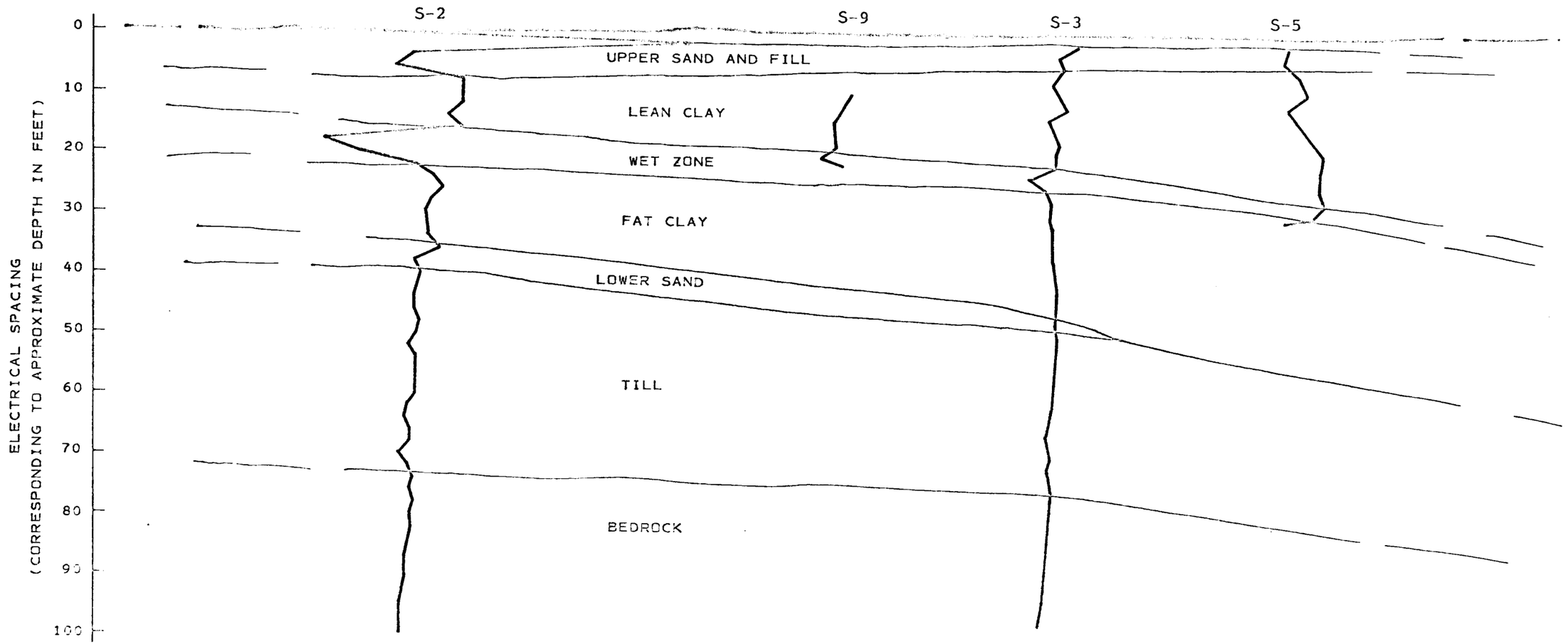
HORIZONTAL SCALE

CROSS SECTION B - B'

BASED ON DOWNHOLE GAMMA LOGS

C

C'

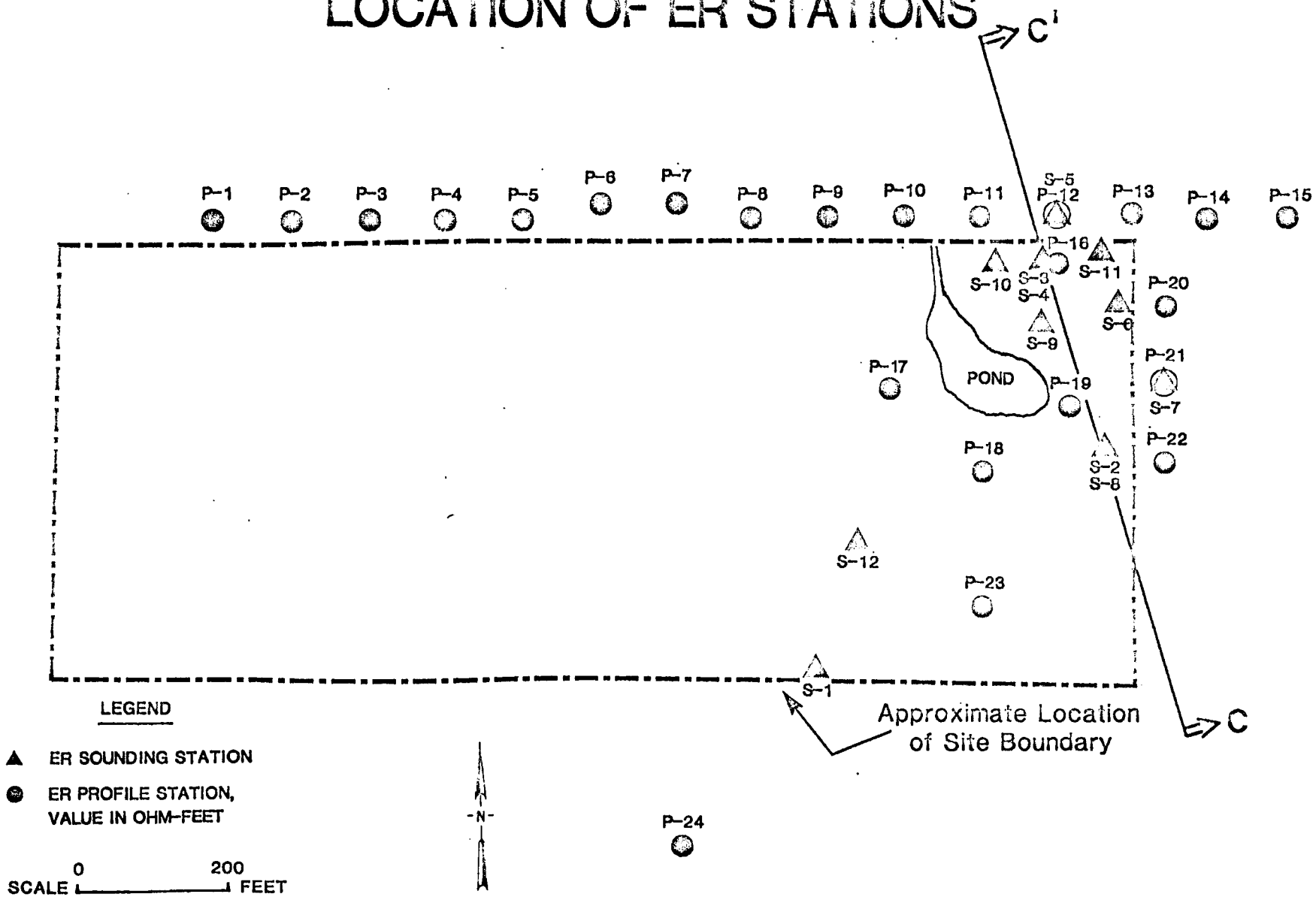


CROSS SECTION C - C'

BASED ON ELECTRICAL RESISTIVITY SOUNDINGS

NIAGARA SANITATION – NASH ROAD SITE

LOCATION OF ER STATIONS

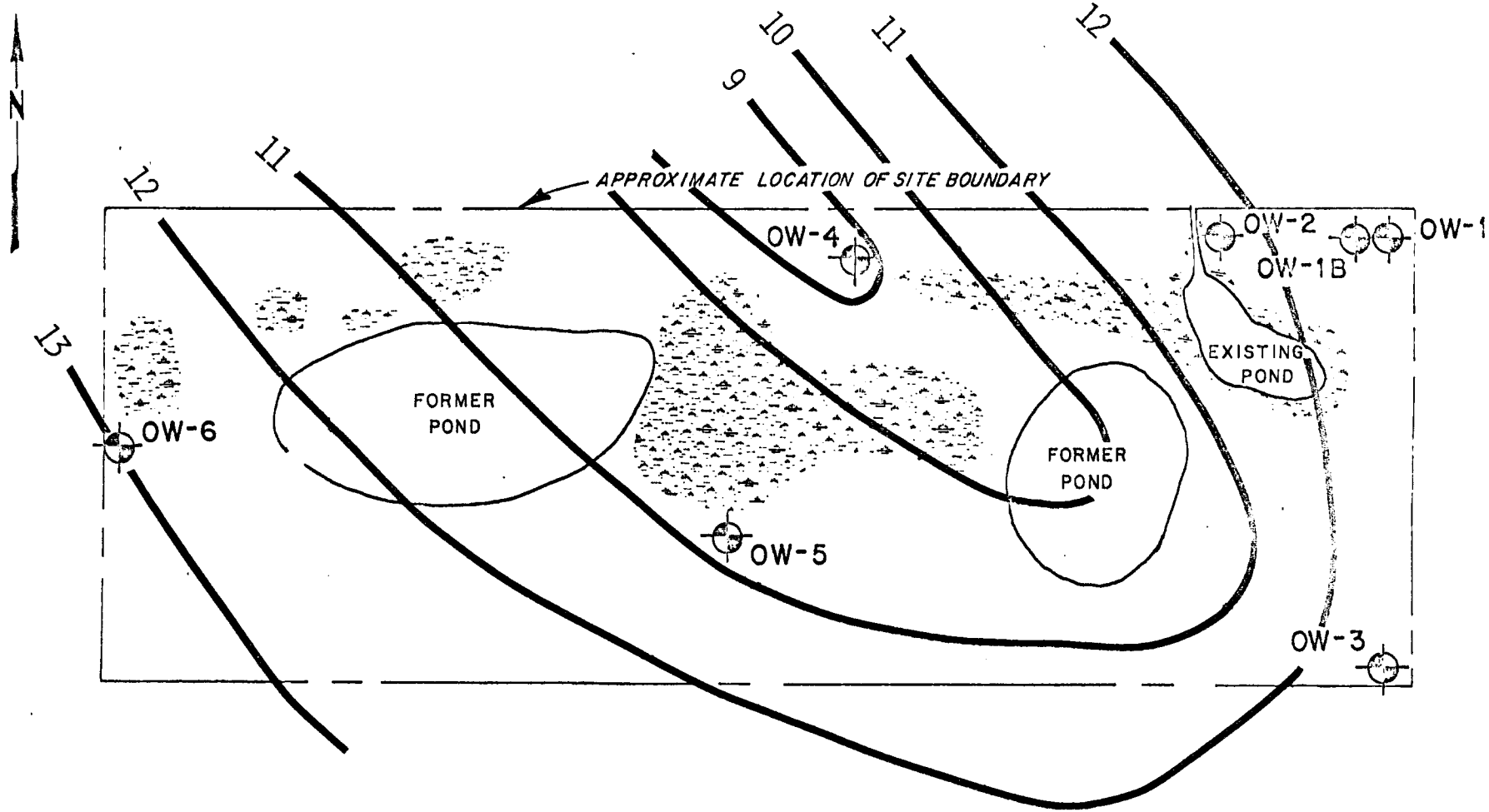


ES ENGINEERING-SCIENCE

FIGURE IV.19

FILE 3305-003-19

BY D. Donner DATE 2/25/84



DEPTH TO PIEZOMETRIC SURFACE IN TILL

NASH ROAD SITE

Note: Values in feet below arbitrary datum.

DAMES & MOORE

FIGURE IV.20

SECTION V

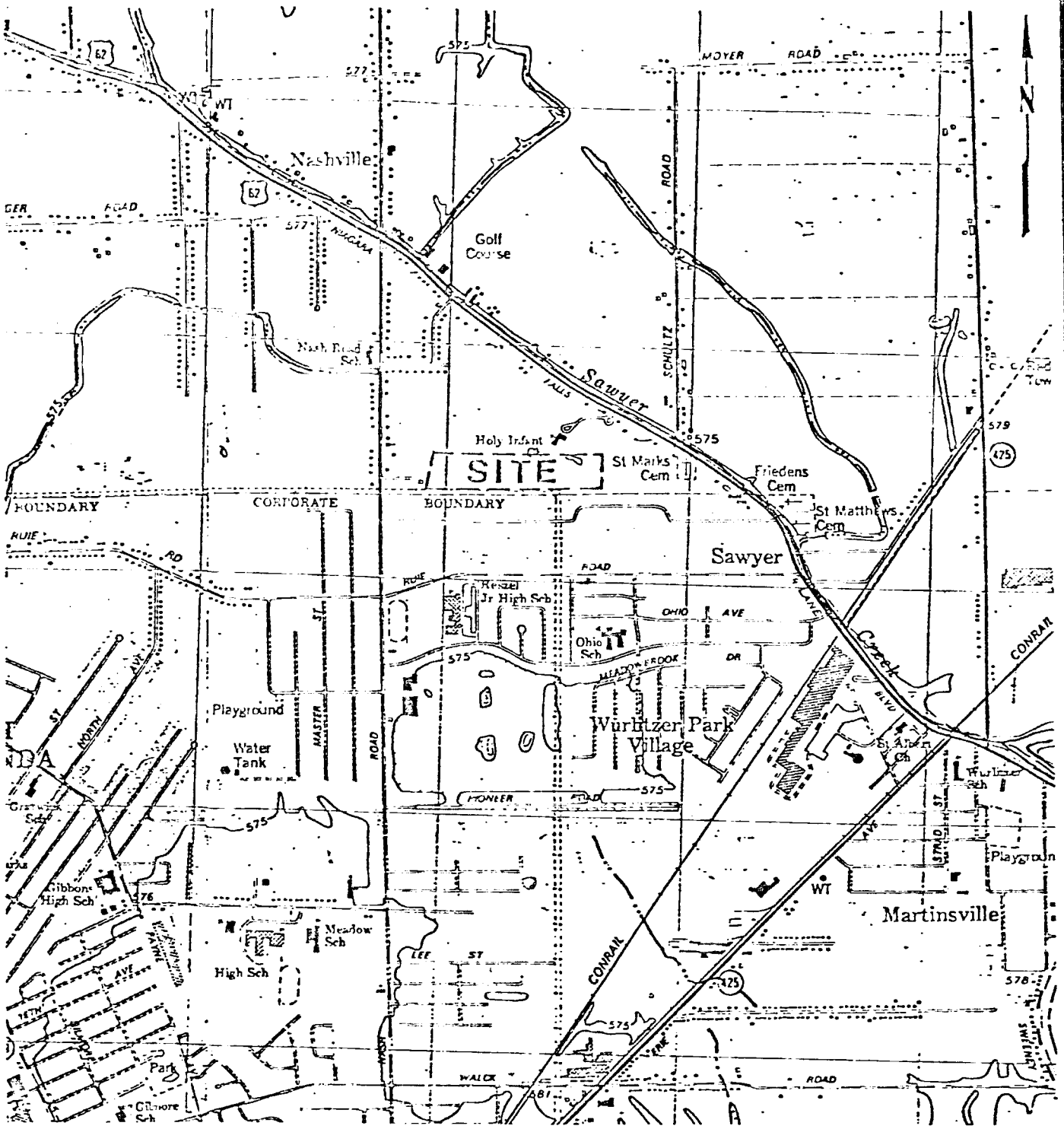
FINAL HAZARD RANKING SYSTEM
for
Niagara Sanitation Landfill
Nash Road
Town of Wheatfield
Niagara County, New York State

The site is an inactive landfill located in the Town of Wheatfield, Niagara County (NYS) adjacent to the North Tonawanda City boundary. The site is rectangular totaling approximately seven acres. The Nash Road site is located in a suburban residential area, and is partly overgrown with trees and marsh vegetation. Nearby residents use the site as a jogging area, dirt bike track, and play area.

The Nash Road site was operated by Niagara Sanitation Company between 1964 and 1968. Both municipal and industrial wastes, including caustic materials and sludges, are disposed at the site. In addition, between 6/6/68 and 7/15/68, approximately 900 cubic yards of chemical waste from Love Canal was disposed in an excavated trench on this site (memo of 8/9/78 to Hennessy, NYSDOT).

Although some wastes are covered, protruding refuse is visible from the ground surface. Current concern centers on the possible unsafe containment of the potentially toxic waste and the migration of these wastes offsite.

Chemical analysis of groundwater and surface sediments is ongoing. Results will be presented in a final Phase II report.



SITE COORDINATES: 43°04' 10.0" N. LAT
78°51' 33.8" W. LONG

REFERENCE: U.S.G.S. 7.5' TOPOGRAPHIC MAP
TONAWANDA EAST, NY (1980) AND
TONAWANDA WEST, NY (1980) QUADRANGLES

SITE LOCATION MAP
NASH ROAD SITE

DAMES & MOORE

FIGURE V.ii.1

HRS COVER SHEET

DRAFT

Facility name: Nash Road Landfill

Location: Town of Wheatfield

EPA Region: II

Person(s) in charge of the facility: Ed Greinert

Town Supervisor

Town of Wheatfield, N.Y.

Name of Reviewer: Eileen Gilligan Date: 8/13/84

General description of the facility:
(For example: landfill, surface impoundment, pile, container; types of hazardous substances; location of the facility; contamination route of major concern; types of information needed for rating; agency action, etc.)

Landfill used by Niagara Sanitation 1964-1968 for both municipal and industrial wastes. Chemical waste from Love Canal was disposed on the site in 1968. Improperly closed, rubbish visible. Phenols, lead, and organics found in soil and groundwater samples.

Scores: S_M = 6.67 (S_{gw} = 5.65 S_{sw} = 10.07 S_a = 0.0)

S_{FE} = 26.25

S_{DC} = 37.50

HRS COVER SHEET

Facility Name: Nash Road Landfill Date: 8/13/84

Surface Water Route Work Sheet

Rating Factor	Assigned Value (Circle One)	Multiplier	Score	Max. Score	Ref. (Section)
1 Observed Release	0 (45)	1	45	45	4.1
If observed release is given a value of 45, proceed to line 4 ✓ If observed release is given a value of 0, proceed to line 2					
2 Route Characteristics					4.2
Facility Slope and Intervening Terrain	0 1 2 3	1		3	
1-yr. 24-hr. Rainfall	0 1 2 3	1		3	
Distance to Nearest Surface Water	0 1 2 3	2		6	
Physical State	0 1 2 3	1		3	
Total Route Characteristics Score				15	
3 Containment	0 1 2 3	1		3	4.3
4 Waste Characteristics					4.4
Toxicity/Persistence	0 3 6 9 12 15 (18)	1	18	18	
Hazardous Waste Quantity	0 1 2 3 4 5 (6) 7 8	1	6	8	
Total Waste Characteristics Score			24	26	
5 Targets					4.5
Surface Water Use	0 1 (2) 3	3	6	9	
Distance to a Sensitive Environment	(0) 1 2 3	2	0	6	
Population Served/ Distance to Water Intake Downstream	(0) 4 6 8 10 12 16 18 20 24 30 32 35 40	1	0	40	
Total Targets Score			6	55	
6 If line 1 is 45, multiply 1 x 4 x 5 ✓ If line 1 is 0, multiply 2 x 3 x 4 x 5			6480	64,350	
7 Divide line 6 by 64,350 and multiply by 100			S_{sw} = 10.07		

SURFACE WATER ROUTE WORK SHEET

Facility Name: Nash Road Landfill Date: 8/13/84

Ground Water Route Work Sheet					
Rating Factor	Assigned Value (Circle One)	Multi-plier	Score	Max. Score	Ref. (Section)
1 Observed Release	0 (45)	1	45	45	3.1
If observed release is given a score of 45, proceed to line 4. ✓					
If observed release is given a score of 0, proceed to line 2.					
2 Route Characteristics					3.2
Depth to Aquifer of Concern	0 1 2 3	2		6	
Net Precipitation	0 1 2 3	1		3	
Permeability of the Unsaturated Zone	0 1 2 3	1		3	
Physical State	0 1 2 3	1		3	
Total Route Characteristics Score				15	
3 Containment	0 1 2 3	1		3	3.3
4 Waste Characteristics					3.4
Toxicity/Persistence	0 3 6 9 12 15 (18)	1	18	18	
Hazardous Waste Quantity	0 1 2 3 4 5 (6) 7 8	1	6	8	
Total Waste Characteristics Score			24	26	
5 Targets					3.5
Ground Water Use	0 (1) 2 3	3	3	9	
Distance to Nearest Well/Population Served	(0) 4 6 8 10 / 12 16 18 20 / 24 30 32 35 40	1	0	40	
Total Targets Score			3	49	
6 If line 1 is 45, multiply 1 x 4 x 5 / If line 1 is 0, multiply 2 x 3 x 4 x 5			3240	57,330	
7 Divide line 6 by 57,330 and multiply by 100			S_{gw} = 5.65		

GROUND WATER ROUTE WORK SHEET

Facility Name: Nash Road Landfill Date: 8/13/84

Air Route Work Sheet					
Rating Factor	Assigned Value (Circle One)	Multi-plier	Score	Max. Score	Ref. (Section)
[1] Observed Release	(0) 45	1	0	45	5.1
Date and Location:	July 1984 Air Quality Survey				
Sampling Protocol:	HNU survey				
If line [1] is 0, the S_a = 0. Enter on line [5] ✓ If line [1] is 45, then proceed to line [2]					
[2] Waste Characteristics					5.2
Reactivity and Incompatibility	0 1 2 3	1		3	
Toxicity	0 1 2 3	3		9	
Hazardous Waste	0 1 2 3 4 5 6 7 8	1		8	
	Total Waste Characteristics Score			20	
[3] Targets					5.3
Population Within 4-Mile Radius	0 9 12 15 18 21 24 27 30	1		30	
Distance to Sensitive Environment	0 1 2 3	2		6	
Land Use	0 1 2 3	1		3	
	Total Targets Score			39	
[4] Multiply [1] x [2] x [3]				35,100	
[5] Divide line [4] by 35,100 and multiply by 100		S_a = 0			

AIR ROUTE WORK SHEET

Facility Name: Nash Road Landfill Date: 8/13/84

Direct Contact Work Sheet					
Rating Factor	Assigned Value (Circle One)	Multi-plier	Score	Max. Score	Ref. (Section)
1 Observed Incident	(0) 45	1	0	45	8.1
If line 1 is 45, proceed to line 4 If line 1 is 0, proceed to line 2 ✓					
2 Accessibility	0 1 2 (3)	1	3	3	8.2
3 Containment	0 (15)	1	15		8.3
4 Waste Characteristics Toxicity	0 1 2 (3)	5	15	15	8.4
5 Targets					8.5
Population Within 1-Mile Radius	0 1 2 (3) 4 5	4	12	20	
Distance to a Critical Habitat	(0) 1 2 3	4	0	12	
Total Targets Score			12	32	
6 If line 1 is 45, multiply 1 x 4 x 5 If line 1 is 0, multiply 2 x 3 x 4 x 5			8100	21,600	
7 Divide line 6 by 21,600 and multiply by 100			S_{DC} = 37.50		

DIRECT CONTACT WORK SHEET

Facility Name Nash Road Landfill Date: 8/13/84

Fire and Explosion Work Sheet

Rating Factor	Assigned Value (Circle One)	Multiplier	Score	Max. Score	Ref. (Section)
1 Containment	1 (3)	1	3	3	7.1
2 Waste Characteristics					7.2
Direct Evidence	(0) 3	1	0	3	
Ignitability	0 1 2 (3)	1	3	3	
Reactivity	(0) 1 2 3	1	0	3	
Incompatibility	(0) 1 2 3	1	0	3	
Hazardous Waste Quantity	0 1 2 3 4 5 (6) 7 8	1	6	8	
Total Waste Characteristics Score			9	20	
3 Targets					7.3
Distance to Nearest Population	0 1 2 (3) 4 5	1	3	5	
Distance to Nearest Building	0 (1) 2 3	1	1	3	
Distance to Sensitive Environment	(0) 1 2 3	1	0	3	
Land Use	0 1 (2) 3	1	2	3	
Population Within 2-Mile Radius	0 1 2 3 (4) 5	1	4	5	
Buildings Within 2-Mile Radius	0 1 2 3 (4) 5	1	4	5	
Total Targets Score			14	24	
4 Multiply 1 x 2 x 3			378	1,440	
5 Divide line 4 by 1,440 and multiply by 100			S_{FE} = 0	26.25	

FIRE AND EXPLOSION WORK SHEET

Facility Name: Nash Road Landfill Date: 8/13/84

Worksheet for Computing S_M

	S	S^2
Groundwater Route Score (S_{gw})	5.65	31.92
Surface Water Route Score (S_{sw})	10.07	101.40
Air Route Score (S_a)	0.0	0.0
$S_{gw}^2 + S_{sw}^2 + S_a^2$		133.32
$\sqrt{S_{gw}^2 + S_{sw}^2 + S_a^2}$		11.54
$\sqrt{S_{gw}^2 + S_{sw}^2 + S_a^2} / 1.73 = S_M =$		6.67

WORK SHEET FOR COMPUTING S_M

DOCUMENTATION RECORDS
FOR
HAZARD RANKING SYSTEM

INSTRUCTIONS: The purpose of these records is to provide a convenient way to prepare an auditable record of the data and documentation used to apply the Hazard Ranking System to a given facility. As briefly as possible summarize the information you used to assign the score for each factor (e.g., "Waste quantity = 4,230 drums plus 800 cubic yards of sludges"). The source of information should be provided for each entry and should be a bibliographic-type reference that will make the document used for a given data point easier to find. Include the location of the document and consider appending a copy of the relevant page(s) for ease in review.

FACILITY NAME: Nash Road Landfill

LOCATION: Nash Road, Town of Wheatfield, Niagara Co., New York

1 OBSERVED RELEASE

Contaminants detected (5 maximum):

lead
nickel
phenol
total halogenated organics
arsenic

Rationale for attributing the contaminants to the facility:

groundwater sample from U.S.G.S. study (1982)

* * *

2 ROUTE CHARACTERISTICS

Depth to Aquifer of Concern

Name/description of aquifers(s) of concern:

1.) shallow aquifer in upper (surface) sand unit

2.) low aquifer at till/bedrock interface

(Engineering Science/Dames & Moore soil borings)

Depth(s) from the ground surface to the highest seasonal level of the saturated zone [water table(s)] of the aquifer of concern:

1.) approximately 0 feet

2.) approximately 8 feet

(ES/D&M soil borings and field investigations)

Depth from the ground surface to the lowest point of waste disposal/ storage:

27 feet in disposal trench

(New York State Department of Transportation memorandum of August 9, 1978)
(Niagara County Department of Health memorandum from M. Hopkins, January 27, 1984)

Net Precipitation

Mean annual or seasonal precipitation (list months for seasonal):

40"

(Federal Register, volume 47 no. 137, Friday July 16, 1982)

Mean annual lake or seasonal evaporation (list months for seasonal):

27"

(Federal Register, volume 47 no. 137, Friday July 16, 1982)

Net precipitation (subtract the above figures):

40" - 27" = 13"

Permeability of Unsaturated Zone

Soil type in unsaturated zone:

In western part of site, surface soil is a fine to medium sand. In eastern part of site, surface soil is clayey silt with trace of fine sand.

Permeability associated with soil type:

1.) western part: 10^{-3} cm/sec (Lambe & Whitman)

2.) eastern part: 5×10^{-4} cm/sec (in-situ test)

Physical State

Physical state of substances at time of disposal (or at present time for generated gases):

solids
liquids in drums

(Dames & Moore site visit)
(memo of August 9, 1978)

3 CONTAINMENT

Containment

Method(s) of waste or leachate containment evaluated:

drums and uncontained wastes

Method with highest score:

drums

4 WASTE CHARACTERISTICS

Toxicity and Persistence

Compound(s) evaluated:

phenol
lead
nickel
arsenic
(U.S.G.S. study of 1982)

chlorotoluenes
benzoyl chloride
benzoic acid
(Hooker letter of May 9, 1968)

Compound with highest score:

lead
(3,3) → 18

Hazardous Waste Quantity

Total quantity of hazardous substances at the facility, excluding those with a containment score of 0 (Give a reasonable estimate even if quantity is above maximum):

900 cubic yards of chemical waste from Love Canal plus unknown quantity of other industrial waste

Basis of estimating and/or computing waste quantity:

DOT memo of August 9, 1978

* * *

5 TARGETS

Ground Water Use

Use(s) of aquifer(s) of concern within a 3-mile radius of the facility:

Available for industrial use

(Discussion with M. Hopkins, Niagara Co. Dept. of Health, 1983)

Distance to Nearest Well

Location of nearest well drawing from aquifer of concern or occupied building not served by a public water supply:

Osterman residential well at 7403 Nash Road (presently unused but useable)

Distance to above well or building:

1,000 feet

Population Served by Ground Water Wells Within a 3-Mile Radius

Identified water-supply well(s) drawing from aquifer(s) of concern within a 3-mile radius and populations served by each:

None.

Computation of land area irrigated by supply well(s) drawing from aquifer(s) of concern within a 3-mile radius, and conversion to population (1.5 people per acre):

Not applicable.

Total population served by ground water within a 3-mile radius:

0.

1 OBSERVED RELEASE

Contaminants detected in surface water at the facility or downhill from it (5 maximum):

TOX
methylene chloride

Rationale for attributing the contaminants to the facility:

Analysis of surface water samples in June 1983 by Engineering Science/ Dames & Moore

* * *

2 ROUTE CHARACTERISTICS

Facility Slope and Intervening Terrain

Average slope of facility in percent:

0%

(U.S.G.S. topographic map; Tonawanda East, N.Y.)

Name/description of nearest downslope surface water:

Sawyer Creek

(U.S.G.S. topographic map; Tonawanda East, N.Y.)

Average slope of terrain between facility and above-cited surface water body in percent:

< 1%

(U.S.G.S. topographic map; Tonawanda East, N.Y.)

Is the facility located either totally or partially in surface water?

Yes. Wastes in swamp areas and in water-filled disposal trenches.

Is the facility completely surrounded by areas of higher elevation?

No.

(U.S.G.S. topographic map; Tonawanda East, N.Y.)

1-Year 24-Hour Rainfall in Inches

2.1"

(Federal Register vol. 47, no. 137, Friday July 16, 1982)

Distance to Nearest Downslope Surface Water

0.25 miles

(U.S.G.S. topographic map; Tonawanda East, N.Y.)

Physical State of Waste

liquid and solid

(Dames & Moore site visit memo of 8/9/78)

* * *

3 CONTAINMENT

Containment

Method(s) of waste or leachate containment evaluated:

drums and uncontained

(NYSDEC memo of August 9, 1978)

Method with highest score:

drums

4 WASTE CHARACTERISTICS

Toxicity and Persistence

Compound(s) evaluated

phenol
lead
iron
nickel
(U.S.G.S. study - 1982)

chlorotoluenes
benzoyl chloride
benzoic acid
(Hooker letter of May 9, 1968)

Compound with highest score:

lead
(3,3) → 18

Hazardous Waste Quantity

Total quantity of hazardous substances at the facility, excluding those with a containment score of 0 (Give a reasonable estimate even if quantity is above maximum):

900 cubic yards of chemical waste from Love Canal and unknown quantity of other industrial waste

Basis of estimating and/or computing waste quantity:

NYSDOT memo of August 9, 1978

* * *

5 TARGETS

Surface Water Use

Use(s) of surface water within 3 miles downstream of the hazardous substance:

recreation
transportation

(numerous ES/D&M site visits)

Is there tidal influence?

No.

Distance to a Sensitive Environment (Ref: U.S.G.S. topographic map)

Distance to 5-acre (minimum) coastal wetland, if 2 miles or less:

None within 2 miles.

Distance to 5-acre (minimum) fresh-water wetland, if 1 mile or less:

None within 1 mile.

Distance to critical habitat of an endangered species or national wildlife refuge, if 1 mile or less:

None within 1 mile.

Population Served by Surface Water

Location(s) of water-supply intake(s) within 3 miles (free-flowing bodies) or 1 mile (static water bodies) downstream of the hazardous substance and population served by each intake:

None.

(U.S.G.S. topographic map; Tonawanda East, N.Y.)

Computation of land area irrigated by above-cited intake(s) and conversion to population (1.5 people per acre):

Not applicable.

Total population served:

0.

Name/description of nearest of above water bodies:

Not applicable.

Distance to above-cited intakes, measured in stream miles.

Not applicable.

1 OBSERVED RELEASE

Contaminants detected:

None detected with HNU meter during air survey of site by Dames & Moore in July, 1984.

Date and location of detection of contaminants

Not applicable.

Methods used to detect the contaminants:

Not applicable.

Rationale for attributing the contaminants to the site:

Not applicable.

* * *

2 WASTE CHARACTERISTICS

Reactivity and Incompatibility

Most reactive compound:

Not applicable.

Most incompatible pair of compounds:

Not applicable.

1 OBSERVED RELEASE

Contaminants detected:

- None detected with HNU meter during air survey of site by Dames & Moore in July, 1984.

Date and location of detection of contaminants

Not applicable.

Methods used to detect the contaminants:

Not applicable.

Rationale for attributing the contaminants to the site:

Not applicable.

* * *

2 WASTE CHARACTERISTICS

Reactivity and Incompatibility

Most reactive compound:

Not applicable.

Most incompatible pair of compounds:

Not applicable.

Toxicity

Most toxic compound:

Not applicable.

Hazardous Waste Quantity

Total quantity of hazardous waste:

Not applicable.

Basis of estimating and/or computing waste quantity:

Not applicable.

* * *

3 TARGETS

Population Within 4-Mile Radius

Circle radius used, give population, and indicate how determined:

0 to 4 mi (0 to 1 mi) 0 to 1/2 mi 0 to 1/4 mi

Approximately 1800 people

(estimate from U.S.G.S. topographic map)

Distance to a Sensitive Environment

Distance to 5-acre (minimum) coastal wetland, if 2 miles or less:

None within 2 miles.

(U.S.G.S. topographic map)

Distance to 5-acre (minimum) fresh-water wetland, if 1 mile or less:

None within 1 mile.

(U.S.G.S. topographic map)

Distance to critical habitat of an endangered species, if 1 mile or less:

None within 1 mile.

(Conversation with G. Batcheller of NYSDEC, Region 9)

Land Use (Ref.: Numerous site visits by ES/D&M personnel)

Distance to commercial/industrial area, if 1 mile or less:

0.01 mile (adjacent to National Fuel Gas installation)

Distance to national or state park, forest, or wildlife reserve, if 2 miles or less:

None within 2 miles.

Distance to residential area, if 2 miles or less:

0.01 mile (adjacent to suburban area)

Distance to agricultural land in production within past 5 years, if 1 mile or less:

0.01 mile (adjacent to corn field)

Distance to prime agricultural land in production within past 5 years, if 2 miles or less:

None within 2 miles.

Is a historic or landmark site (National Register or Historic Places and National Natural Landmarks) within the view of the site?

No.

OFFICE MEMORANDUM SYRACUSE

ACTION	INFO	
To:		File: 13305-001
		X-Ref:
		Date: 5/2/83

From: Eileen Gillispie Reply Required By:

Subject: Conversation with Niagara Co DOH - Mike Hopkins

Reference(s):

Met with Mike Hopkins of Niagara Co DOH to discuss Phase I sites in Niagara Co.

Re: Nash Rd site

He is unaware of any use for the shallow or deep aquifers, although believes it could be used for industrial purposes, if so desired.

Eileen

ROUTING

OFFICE MEMORANDUM

SYRACUSE

ACTION	INFO	
To:		File: 13305-001
		X-Ref:
		Date: 5/2/83

From: Eileen Gilligan

Reply Required By:

Subject: Endangered Species / Critical Habitat

Reference(s):

On 5/2/83 I met with Gordon Batcheller of Fish + Wildlife NYSDEC Region 9 (Buffalo). He showed me maps outlining wetland + critical habitats for the Buffalo + Niagara Falls areas. The area is in the migratory pathway of falcons + eagles, but there are not critical habitats for these birds within 1 mile.

Eileen

ROUTING

NIAGARA COUNTY HEALTH DEPARTMENT

MEMORANDUM

DATE: January 27, 1984

TO: Peter Buechi

FROM: Michael Hopkins

SUBJECT: INFORMATION REGARDING NIAGARA SANITATION
NASH ROAD LANDFILL (REQUESTED IN DECEMBER 1983
TELEPHONE CONVERSATION)

Attached are copies of various documents from our files regarding the Niagara Sanitation - Nash Road Site. These documents are provided for your information and may be provided to your consultants for Phase II State Superfund investigation provided this department is properly credited for any information used in the Phase II report or subsequent reports.

This department has various other information regarding this site which is not attached but is available for inspection if desired. This information includes drawings of the Hooker "Brine Line", City of North Tonawanda Sewer maps for nearby areas, original drawings by Krehbiel Engineers showing the proposed location and dimensions of the disposal trench for Love Canal wastes, original letters between DOT and NCHD (1968) and original boring logs and locator drawings for test borings made on site in 1968 prior to digging the disposal trench.

The investigation conducted by this department in June, July and August of 1983 came to the following conclusions:

1. There is reasonable evidence in the form of plans, correspondence, etc., which indicates that wastes from the Love Canal were disposed of at this site. It is suspected that disposal occurred in a trench dug specifically for this purpose.

2. This department was unable to locate any person who claims to have been present when Love Canal wastes were disposed of or who could provide first-hand information on such disposal.

3. Various area residents, former residents, City of North Tonawanda officials and a former equipment operator have reported that industrial wastes were observed in areas of landfill used for municipal disposal. Those wastes are said to include caustics in drums, battery cases, graphite, pallets and laminating compounds, but not the wastes from Love Canal.

4. It is believed that much of the municipal waste and the industrial wastes listed above were buried in former ponds and borrow pits. Most of the disposal area was always wet and swampy prior to disposal activity. At least one large trench was dug specifically for municipal waste disposal.

5. There is no specific evidence indicating that off site migration of contaminants has occurred or that a direct contact hazard is present; however, the available data is not conclusive in this respect.

This department considers follow-up investigation at this site to be necessary. Additional sampling and analysis of soil and groundwater are considered necessary to confirm whether or not residential areas adjacent to the site have been impacted by contaminants from the site. This department is also concerned that adequate data is not available to assess the potential of exposure to persons who may be on site, regardless of whether such persons are on site legally or illegally.

This department requests that we be kept informed of any activities of DEC with respect to this site and that we be kept informed of any additional information your department may have or obtain in the future.

Please feel free to contact me with any questions.

MEH:cs
Attachments

cc: M. N. Vaughan

August 9, 1978

Disposal of Chemical Waste
Contract FAC 67-15; FALSE 67-1
LaSalle Arterial, Niagara Falls, Niagara County

ORIGINAL SIGNED BY
D. H. KETCHUM

D. H. Ketchum, Regional Director - Region 5

W. C. Hennessy, Commissioner of Transportation, Bldg. 5, Room 507

cc ~~John Conroy~~ M. J. Cuddy

During the course of construction of the LaSalle Arterial in the City of Niagara Falls, buried chemical waste was encountered during excavation for a storm sewer line along Frontier Avenue between 97th and 99th Streets. Further exploration revealed that the chemical waste material extended under the proposed location of relocated Frontier Avenue north of the existing street. The total quantity of chemicals in the proposed roadway was estimated to be 1100 CY. No chemicals were found under, or south of, existing Frontier Avenue.

When the sewer line excavation first began, the chemicals were piled to one side along with the other excavated material. This prompted several complaints from adjacent property owners about the offensive odor of the material.

After consulting with Hooker Chemical and the Niagara County Health Department, some of the chemicals were trucked to an existing dump owned by Hooker off Hyde Park Blvd. near the north city line of Niagara Falls. After approximately 200 CY were disposed of at this location, the contractor was advised by Hooker officials that no more would be accepted at their dump.

After negotiation with the Town of Wheatfield, and with the approval of the Niagara County Health Department, the remainder of the chemical waste was trucked to a Town dump area off Nash Road in the Town of Wheatfield.

The following is a chronological summary of events from March 15, 1968, when the chemicals were first encountered to July 15, 1968, when the disposal of the chemicals was completed.

Date	Event	Source
3-15-68	First encountered chemical waste material between 97th and 99th Sts. in relocated Frontier Ave. area.	Engineer's Diary
3-15-68	Contacted Hooker Chem. Co. requesting information on material makeup.	Joe Cains Diary
3-19-68	Mr. Capong, property owner, complained of stench coming off chemical waste stockpile.	Engineer's diary Joe Cain's diary

e	Event	Source
)-68	Messrs. Popovici, Maida, Niagara County Health Dept. investigating	Joe Cain's diary
3-22-68	Ken Reitmeier, Supervising Soils and Materials Engr., investigated and wrote memo this date recommending removal of chemical waste.	Memo dated 3-22-68
3-25-68	Mr. Popovici telephoned ordering chemical waste excavated to date, removed from project site and disposted of at a dump operated by Hooker Chemical Co. located off Hyde Park Blvd. near north city line.	Joe Cain's diary
3-27-68	Letter confirming the telephone conversation 3-25-68 from Ernest R. Gedeon, Niagara County Health Dept.	Letter dated 3-27-68
4-1-68	Letter from J.P. Cain, ordering contractor to remove chemical waste to the Hooker Dump on Hyde Park Blvd.	Letter dated 4-1-68
4-1-68	Stimm sent letter disputing work to removed chemical waste material.	Letter dated 4-1-68
4-3-68	Removal of chemical waste to Hooker's dump site off Hyde Park Blvd. began.	Joe Cain's diary
4-8-68	Hooker officials (Fred T. Olotka) ordered a halt to further dumping of chemical waste at their Hyde Park Blvd. dump. Niagara County Health Dept. informed.	Joe Cain's diary.
4-15-68	Letter to Robert W. Sweet, Chief Engineer from A. J. Kopczynski recommending extra payment for work to remove approx. 1,000 CY of chemical waste.	Letter dated 4-15-68
4-23-68	Letter to J. P. Cain from Stimm requesting permission to use Town of Wheatfield dump site.	Letter dated 4-23-68
4-25-68	Maps and borings received from Krehbiel, Quay, Rugg & Hall, Engr. - Bel Air Subdivision.	Package dated 4-25-68
5-1-68	Letter to Ernest R. Gedeon, Chief Air Pollution Control, Niagara County Health Dept. from J.P. Cain outlining proposed method of disposing of chemical waste.	Letter dated 5-1-68

Date	Event	Source
5-3-68	Wm. Friedman, Jr., Asst. Comm. of Env. Health, telephoned listing information he will require before approval of Wheatfield site is given.	Memo to Files dated 5-3-68
5-6-68	Letter from Friedman confirming the above telephone conversation (5-3-68) to Brzeninski (Stimm) requesting permission to use Wheatfield dump.	Letter dated 5-6-68
5-9-68	Letter from Hooker (Fred Olotka), listing makeup of chemical waste from ground samples taken.	Letter dated 5-9-68
5-16-68	Boring taken on Frontier Ave. between 97th and 99th Sts. to determine the limits of chemical waste.	Memo dated 5-16-68, P. Nowadl to J.P.Cain
5-16-68	Borings of proposed Wheatfield dump site sent to Friedman, Niagara County Health.	Letter dated 5-16-68, P. Nowadly to Friedman
5-21-68	Verbal permission received from Friedman granting permission to use Wheatfield site. Letter ordering Stimm to excavate and remove chemical waste to Wheatfield.	J. Cain's diary. Letter dated 5-21-6 Cain to Stimm.
5-27-68	Began excavating Wheatfield dumpsite.	MURK II dated 5-27-68
6-6-68	Began hauling chemical waste to dump.	MURK II 6-6-68
7-15-68	Complete all work including regrading dump site.	MURK II 7-15-68

The disposal area off Nash Road was visited on August 8, 1978 by J. Powers, Jr., and P. Goodman of my staff. Although they were unable to pin point the exact location of the buried chemicals, the approximate area was examined and no sign of the chemicals was found. The area in which the chemicals were buried was an excavation approximately 100 ft. by 30 ft. by 27 ft. deep. The area is located in a Town of Wheatfield dump just north of the North Tonawanda City Line, approximately 1/2 mile east of Nash Road and 1/2 mile south of Niagara Falls Blvd. There has been no development in the area and no apparent hazard exists at this time.

Our records indicate that the chemicals were placed in the 100' x 30' area to a depth of approximately 15 ft. and covered with at least 12 ft. of the excavated material. A review of Inspectors' reports indicates that the estimate of 1100 CY of chemicals was exceeded by about 50 percent for a total of 1600 CY ± placed in this excavation.

Disposal of the chemicals in the Nash Road area was done with the full knowledge and consent of the Town of Wheatfield and the Niagara County Health Dept. Soil exploration was conducted by our Soils Engineer prior to disposal of the chemicals and the area was found to be acceptable for disposal purposes.

Attached are copies of all pertinent correspondence, drawings and boring logs.

DHK:JEP:mh

Attachments

Hooker Industrial chemicals DIVISION

NIAGARA FALLS, NEW YORK 14302, PHONE (716) 285-6655

May 9, 1968

Mr J P Caine
Resident Engineer NYS Dept of Transportation
355 - 77th Street
Niagara Falls, New York

Subject: LaSalle Expressway - Ground Samples

Dear Mr Caine:

This letter is written in reply to your phone conversation with us on May 3rd.

Samples of liquors taken from the 97 - 99th Streets excavation on March 15, 1968 analyzed as follows:

Specific gravity @ 25°C	=	1.198
pH	=	3.0
Loss on ignition	=	86.4%
Flash pt °F		130 (Cleveland open cup)
Chlorate, Phosphorous and Fluoride	=	None

We were able to detect small amounts of chlorotoluenes, trace benzoyl chloride and approximately 5% benzoic acid in this material.

The sample taken represented the worst portion of the excavation. It was obtained from organic puddles in the vicinity of the dirt pile.

Very truly yours

Fred T Olotka
Technical Supervisor
sj

cc W M Friedman - Niagara County Health Department
E R Gedeon - Niagara County Health Department
E Padlo
J N Brogard

NEW YORK STATE GEOLOGICAL ASSOCIATION

54th ANNUAL MEETING

October 8-10, 1982

Amherst, New York

GUIDEBOOK FOR FIELD TRIPS IN WESTERN NEW YORK, NORTHERN PENNSYLVANIA AND ADJACENT, SOUTHERN ONTARIO

Edward J. Buehler

and

Parker E. Calkin

Editors

Department of Geological Sciences
State University of New York at Buffalo

Held in Conjunction with
11th Annual Meeting Eastern
Section American Association
of Petroleum Geologists

Published by the New York State Geological Association. Guidebook available from the executive secretary: M.P. Wolf, Geology Department, Gittleson Hall, Hofstra University, Hempstead, New York 11550.

NEW YORK STATE GEOLOGICAL ASSOCIATION

38th Annual Meeting

April 29 - May 1, 1966

GUIDEBOOK

Geology of Western New York

Edward J. Buehler, Editor

Department of Geological Sciences
State University of New York at Buffalo

Additional copies are available from the permanent secretary of the New York State Geological Association: Dr. Kurt E. Lowe, Department of Geology, City College of the City University of New York, 139th St. at Convent Ave., New York, N. Y.

Soil Mechanics

T. William Lambe • *Robert V. Whitman*

Massachusetts Institute of Technology

1969

John Wiley & Sons, Inc.

New York London Sydney Toronto

in which

k = the Darcy coefficient of permeability
D_s = some effective particle diameter
γ = unit weight of permeant
μ = viscosity of permeant
e = void ratio
C = shape factor

The following is an expression for the permeability of porous media, known as the *Kozeny-Carman equation* since it was proposed by Kozeny and improved by Carman:

$$k = \frac{1}{k_0 S^2} \frac{\gamma}{\mu} \frac{e^3}{(1+e)} \tag{19.5}$$

in which

k_0 = factor depending on pore shape and ratio of length of actual flow path to soil bed thickness
S = specific surface area

Since D_s is defined as the diameter of particle having a specific surface of S, Eq. 19.4 can be considered a simplification of the Kozeny-Carman equation.

Table 19.1 Coefficient of Permeability of Common Natural Soil Formations

Formation	Value of k (cm/sec)
River deposits	
Rhone at Genissiat	Up to 0.40
Small streams, eastern Alps	0.02–0.16
Missouri	0.02–0.20
Mississippi	0.02–0.12
Glacial deposits	
Outwash plains	0.05–2.00
Esker, Westfield, Mass.	0.01–0.13
Delta, Chicopee, Mass.	0.0001–0.015
Till	Less than 0.0001
Wind deposits	
Dune sand	0.1–0.3
Loess	0.001 ±
Loess loam	0.0001 ±
Lacustrine and marine offshore deposits	
Very fine uniform sand, U^a = 5–2	0.0001–0.0064
Bull's liver, Sixth Ave., N.Y., U = 5–2	0.0001–0.0050
Bull's liver, Brooklyn, U = 5	0.00001–0.0001
Clay	Less than 0.0000001

[a] U = uniformity coefficient.
From Terzaghi and Peck, 1967.

Table 19.2 Classification of Soils According to Their Coefficients of Permeability

Degree of Permeability	Value of k (cm/sec)
High	Over 10^{-1}
Medium	10^{-1}–10^{-3}
Low	10^{-3}–10^{-5}
Very low	10^{-5}–10^{-7}
Practically impermeable	Less than 10^{-7}

From Terzaghi and Peck, 1967.

Equation 19.4 or 19.5 aids considerably in the following examination of the variables affecting permeability. In this examination those characteristics related to the permeant are considered first and then those related to the soil composition are treated.

Permeant

Equations 19.4 and 19.5 show that both the viscosity and the unit weight of the permeant influence the value of permeability. These two permeant characteristics can be eliminated as variables by defining another permeability, the *specific* or *absolute* permeability, as:

$$K = \frac{k\mu}{\gamma} \tag{19.6}$$

Since k is in units of velocity, K is in units of length^2; e.g., if k is in cm/sec, the corresponding unit for K is cm^2. K is also expressed in terms of darcys; 1 darcy = 0.987×10^{-8} cm^2. For water at 20°C, the following two equations permit one to convert k in cm/sec to K in cm^2 or in darcys:

$$K \text{ in cm}^2 = k \text{ in cm/sec} \times 1.02 \times 10^{-5} \tag{19.7}$$

$$K \text{ in darcys} = k \text{ in cm/sec} \times 1.035 \times 10^{3} \tag{19.8}$$

Figure 19.6 is a chart for the conversion of permeability values from one set of units to another. (Conversion factors are given in the appendix.)

While viscosity and unit weight are the only variables of the permeant that influence the permeability of pervious soils, other permeant characteristics can have a major influence on the permeability of relatively impervious soils. The magnitude of influence for characteristics other than viscosity and unit weight are illustrated in Fig. 19.7. In this figure values of permeability of saturated kaolinite are plotted for various permeants. The permeability is expressed in terms of the absolute permeability, thus the influences of viscosity and unit weight have been eliminated. The data in Fig. 19.7 show that the nature of the permeant can be very important, with variations of many hundred percent in absolute permeability depending on the actual permeant. The

Protection of Environment

40

PARTS 190 to 399

Revised as of July 1, 1983

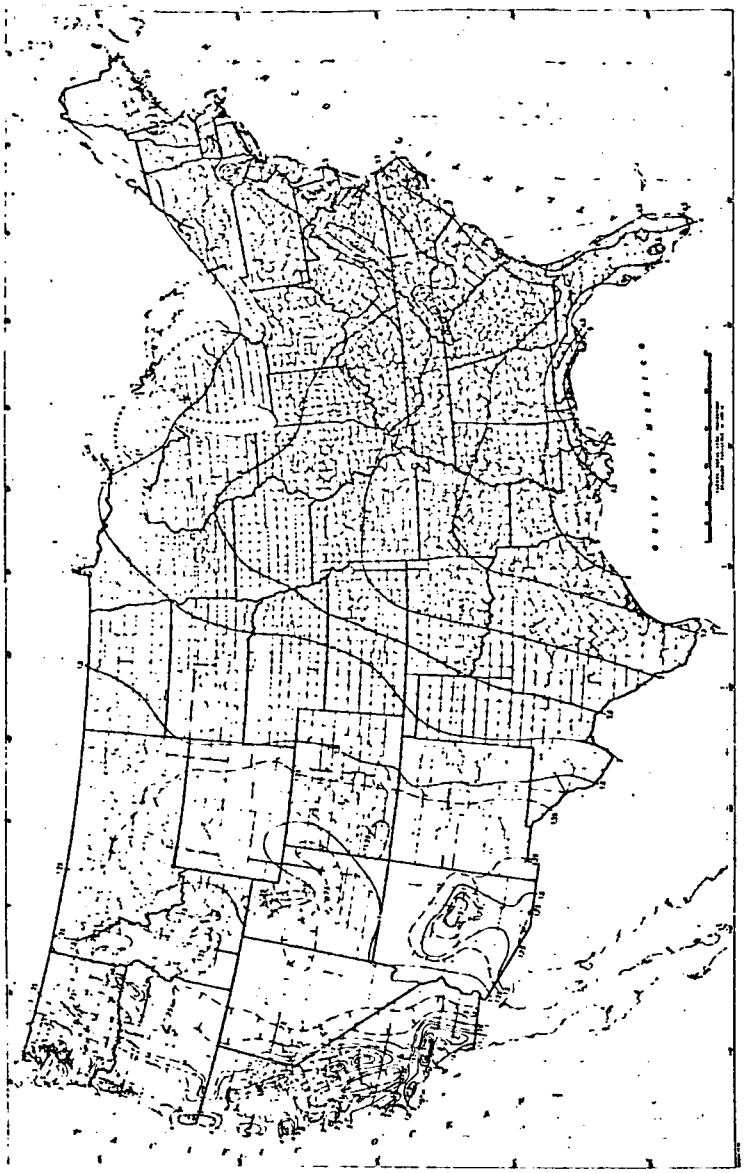
CONTAINING
A CODIFICATION OF DOCUMENTS
OF GENERAL APPLICABILITY
AND FUTURE EFFECT

AS OF JULY 1, 1983

With Ancillaries

Published by
the Office of the Federal Register
National Archives and Records Service
General Services Administration

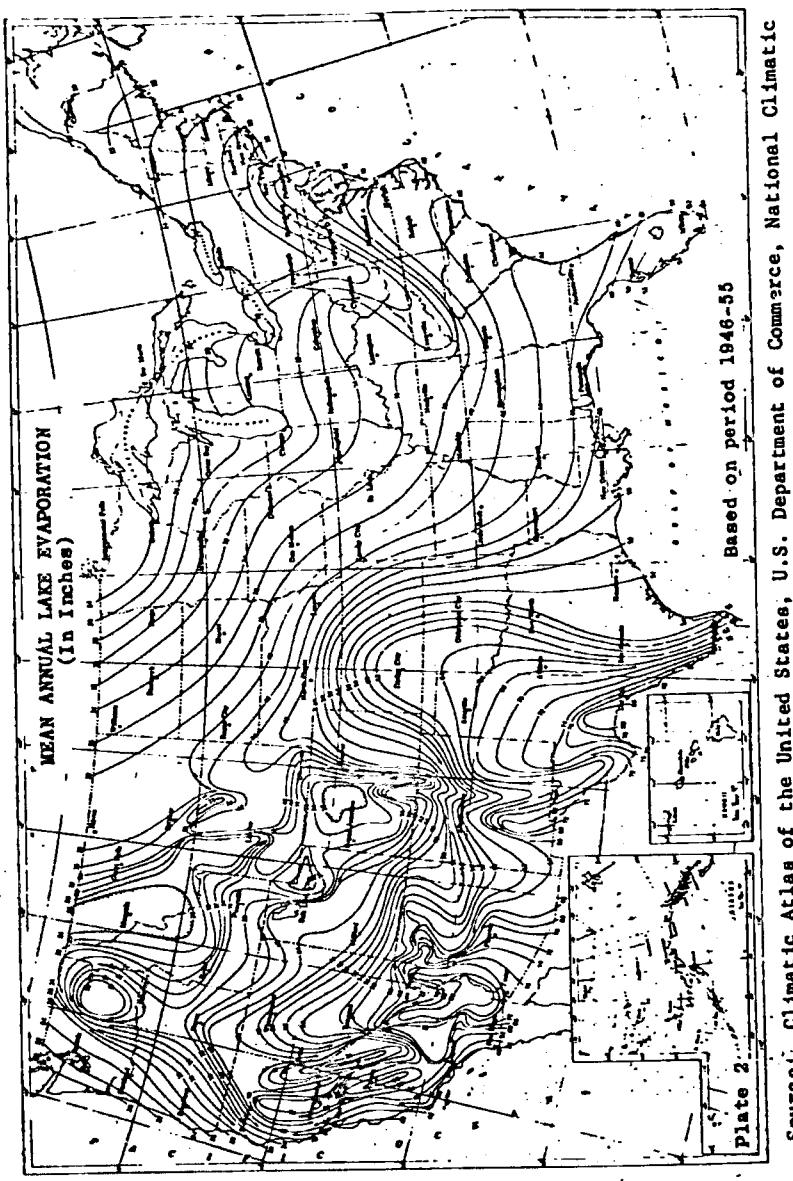
as a Special Edition of
the Federal Register



Source: Rainfall Frequency Atlas of the United States, Technical Paper No. 40, U.S. Department of Commerce, U.S. Government Printing Office, Washington, D.C., 1963.

Figure 8

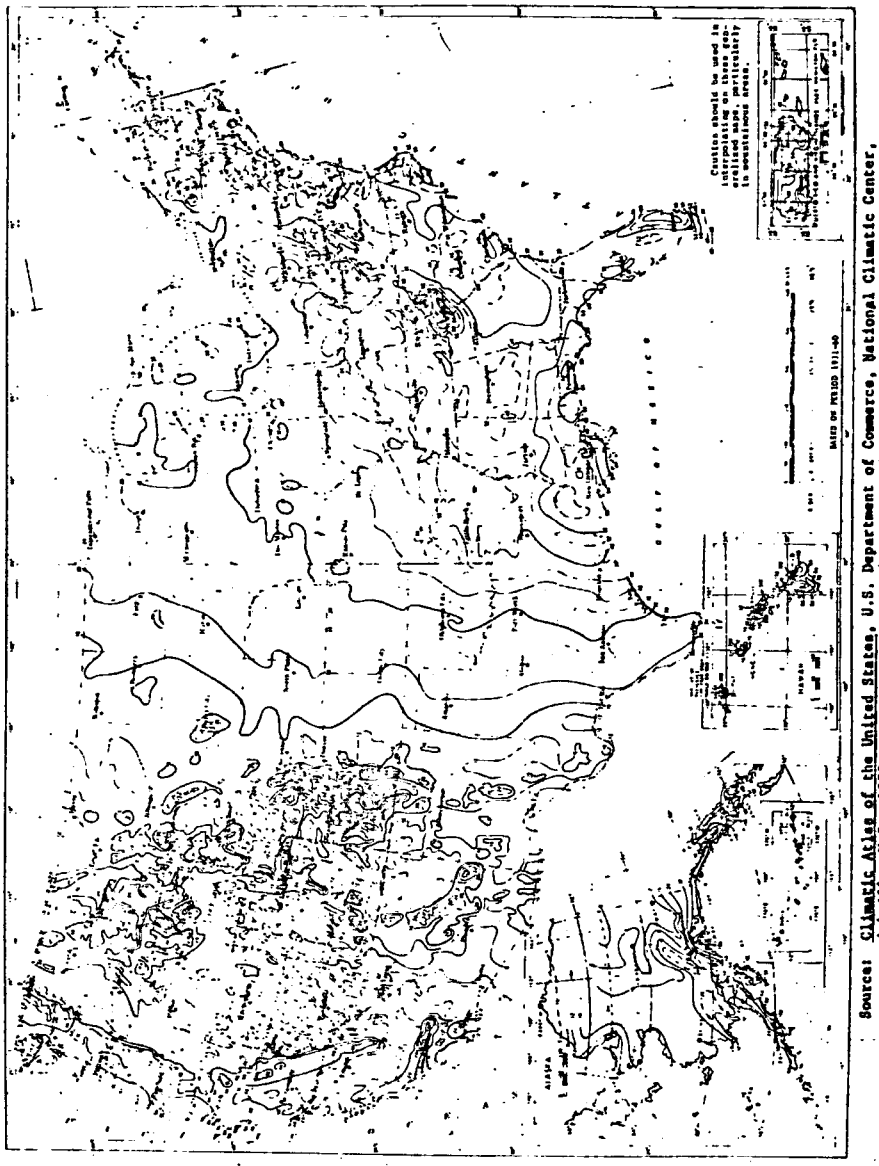
1-Year 24-Hour Rainfall (Inches)



Source: Climatic Atlas of the United States, U.S. Department of Commerce, National Climatic Center, Ashville, N.C., 1979.

Figure 4

Mean Annual Lake Evaporation (In Inches)



Source: Climatic Atlas of the United States, U.S. Department of Commerce, National Climatic Center, Asheville, N.C., 1979.

Figure 5
Normal Annual Total Precipitation (inches)

Niagara County DOH, 1981

NAME OF LANDFILL

NIAGARA SANITATION COMPANY (DEC #932054)

LOCATION Nash Road, Town of Wheatfield

The site is estimated to be about seven acres in size and located north of the Niagara Mohawk easement which straddles the North Tonawanda - Wheatfield town line. The site extends from the eastern end of the access road running from Nash Road approximately 350 yards east to the fork in the power easement (Tower #365). The site is estimated to be 120 yards wide at the western end tapering to about 70 yards wide at the eastern end.

The landfill location and extent are shown on the attached drawing.

OWNERSHIP

The property is owned by the Town of Wheatfield.

HISTORY

This landfill was used by the Niagara Sanitation Company for waste disposal from 1964 to 1968. The refuse site was used for both industrial and municipal refuse. The site received refuse from Niagara Falls Air Force Base, Bell Aerospace, Carborundum, Frontier Chemical, Graphite Specialties, Continental Can and Grief Bros. Wastes disposed of may include caustics, plating tank sludge and municipal wastes.

Historical information was obtained from Hazardous Waste Disposal Sites in New York State, Volume 3, NYS DEC.

INVESTIGATION

A site visit was made by Mr. M.E. Hopkins of the Niagara County Health Department on June 11, 1981. The site was found to be poorly covered with protruding refuse. Visible items included rubber blocks, tubes and hoses, tires, concrete fragments and other demolition debris, broken glass, ash, wood, rusted cans and pieces of graphite rods. Also found were what appeared to be remnants of steel drums. There was evidence of some unauthorized dumping after the site was closed. Access to the site was not restricted.

Red-brown (rust-colored) stains were found on vegetation and soil in numerous locations around the perimeter of the site, particularly along the northern and western edges. Additional stained areas were found throughout the marshes and other low points within the site. Although most of these stained areas were dry, two areas were found beneath standing water. It was noted that although the ground was stained beneath the water, the water was not discolored. No flowing leachate streams were found. The sampling well was not found on the June 11th visit. A well was found on June19th on a subsequent visit. The well was located 20 feet east of Niagara Mohawk Tower #363. The location is shown on the attached drawing. The well had apparently been

INVESTIGATION (continued)

vandalized. The upper standpipe had been broken off at ground level and the well had, therefore, been left uncovered. The well may still be useable for sampling.

No evidence of landfill activity was noted east of Niagara Mohawk Tower #365. However, USDA aerial photographs (ARE 3V-75;1966) indicate that the landfilled area may extend 300 to 400 ft. east of Tower #365.

SOILS

The soils surrounding the site are Raynham and Canandaigua series soils. The composition of the soil contained with the site itself is not known, although it is expected to be largely composed of refuse. The surface is generally a silty clay material with some sand in spots. Portions of the site are marshy while others appear well drained, indicating that the soil may not be uniform throughout the site. Boring records of the sampling well immediately south of the site, indicate a profile of silty sand and sandy silt to a depth of about 9 feet over clay to an unknown depth. The records also show the water table at 4 feet. This suggests that the water table may be perched. Fluctuations of the water table are not known.

CONCLUSIONS

The potential for the migration of contaminants off-site is present. Visible leachate stains and the odor in the well south of the landfill indicate that material may be leaching in perched groundwater. Permeable soils in some areas could allow lateral migration. The site requires proper closing. The proximity of houses along Forbes Road and potential for migration justify sampling at this site.

SAMPLING

Well and soil samples were taken for THO, heavy metals and phenol analysis. It was noted at the time of sampling, that the water drawn from the well was discolored gray and strongly odorous with an organic odor. A slight oily sheen was present on the surface of the sample. Two soil samples were taken near Towers #364 and #365. These samples were taken from the bottoms of hand augered holes roughly 4 feet deep. The boring near pole #364 indicated a gray silt over a darker gray silty clay layer at the point of sampling. The second boring showed a tan silty clay over clay at about 4 feet. The sample was taken from this interface. Groundwater was encountered slightly below the 4 foot level in both holes.

RECOMMENDATIONS

This site must be properly closed. Additional sampling wells along the Niagara Mohawk easement would be desireable to facilitate future sampling. The existing well should be maintained. Annual inspection and periodic monitoring is recommended. The Town of Wheatfield was notified to submit an abatement plan for the site..

SUMMARY OF SAMPLES TAKEN

SAMPLE #	LOCATION	TYPE	PARAMETER	DATE	NEAREST HOUR
1	Gratwick # 13	Well	Metals	7/16/81	11:00
2	Gratwick # 10	Well	Metals	7/16/81	11:00
3	Gratwick # 11	Well	Metals	7/16/81	11:00
4	Gratwick # 12	Well	Metals	7/16/81	11:00
5	Gratwick # 13	Well	THO	7/16/81	11:00
6	Gratwick # 10	Well	THO	7/16/81	11:00
7	Gratwick # 11	Well	THO	7/16/81	11:00
8	Gratwick # 12	Well	THO	7/16/81	11:00
9	Nia. Sanitation	Well	Metals	7/16/81	1:00
10	Nia. Sanitation	Well	THO	7/16/81	1:00
11	Zimmerman	Well	THO	7/16/81	12:00
12	Old Falls	Well	THO	7/16/81	12:00
13	Artpark	Leachate	Metals	7/17/81	12:00
14	Artpark	Leachate	THO	7/17/81	12:00
15	PASNY	Soil	Metals	7/21/81	10:00
16	PASNY	Soil	THO	7/21/81	10:00
17	Nia. Sanitation	Soil	Metals	7/24/81	12:00
18	Nia. Sanitation	Soil	THO	7/24/81	12:00
19	Nia. Sanitation	Soil	Metals	7/24/81	12:00
20	Nia. Sanitation	Soil	THO	7/24/81	12:00
21	Walck Road	Soil	THO	7/24/81	12:00
22	Gratwick # 13	Well	Phenol	8/12/81	10:00
23	Gratwick # 10	Well	Phenol	8/12/81	10:00
24	Gratwick # 11	Well	Phenol	8/12/81	10:00
25	Gratwick # 12	Well	Phenol	8/12/81	10:00
26	Zimmerman	Well	Phenol	8/12/81	11:00
27	Old Falls	Well	Phenol	8/12/81	11:00
28	Nia. Sanitation	Well	Phenol	8/12/81	12:00
29	Olin-Industrial Welding	Soil	THO, TOC Lindane	9/07/81	12:00

ANALYTICAL RESULTS FOR SAMPLES TAKEN AT GRATWICK - RIVERSIDE PARK

WELL # 10

Sample # 2	Sampled 11:00	7/16/81
Cadmium, total	L.T. 0.02 MG/L	
Chromium, total	L.T. 0.1 MG/L	
Lead; total	L.T. 0.1 MG/L	
Mercury, total	L.T. 0.4 MCG/L	
Nickle, total	0.05 MG/L	
Sample # 6	Sampled 11:00	7/16/81
THO	35 MCG/L	
Sample #24	Sampled 10:00	8/12/81
Phenol	3 MG/L	

WELL # 11

Sample # 3	Sampled 11:00	7/16/81
Cadmium, total	L.T. 0.02 MG/L	
Chromium, total	L.T. 0.1 MG/L	
Lead, total	L.T. 0.1 MG/L	
Mercury, total	L.T. 0.4 MCG/L	
Nickle; total	L.T. 0.05 MG/L	
Sample # 7	Sampled 11:00	7/16/81
THO	Less than 1 MCG/L	
Sample # 25	Sampled 10:00	8/12/81
Phenol	3 MG/L	

WELL # 12

Sample # 4	Sampled 11:00	7/16/81
Cadmium, total	L.T. 0.02 MG/L	
Chromium, total	L.T. 0.1 MG/L	
Lead, total	L.T. 0.1 MG/L	
Mercury, total	L.T. 0.4 MCG/L	
Nickle, total	L.T. 0.05 MG/L	
Sample # 8	Sampled 11:00	7/16/81
THO	4 MCG/L	
Sample # 26	Sampled 10:00	8/12/81
Phenols	0.2 MG/L	

GRATWICK - RIVERSIDE PARK (continued)

WELL # 13

Sample # 1	Sampled 11:00			7/16/81
Cadmium, total	L.T.	0.02	MG/L	
Chromium, total	L.T.	0.1	MG/L	
Lead, total		0.1	MG/L	
Mercury, total	L.T.	0.4	MCG/L	
Nickle, total		0.05	MG/L	
Sample # 5	Sampled 11:00			7/16/81
THO	18	MCG/L		
Sample # 22	Sampled 10:00			8/12/81
Phenols	17	MG/L		

RESULTS OF SAMPLES TAKEN AT NIAGARA SANITATION SITE

WELL SAMPLES

Sample # 9	Sampled 1:00			7/16/81
Cadmium, total	L.T.	0.02	MG/L	
Chromium, total	L.T.	0.1	MG/L	
Lead, total		0.2	MG/L	
Mercury, total	L.T.	0.4	MCG/L	
Nickle, total		0.12	MG/L	
Sample # 10	Sampled 1:00			7/16/81
THO	4	MCG/L		
Sample # 28	Sampled 12:00			8/12/81
Phenol		0.008	MG/L	

well + sample location not marked on map

SOIL SAMPLES

Samples # 17,18,19 & 20 all Sampled 10:00 7/24/81
Samples # 17 & 18 Metals - Results not yet available
Sample # 19 L.T. 10 PPB THO
Sample # 20 L.T. 10 PPB THO

RESULTS OF SAMPLES TAKEN AT ARTPARK

LEACHATE SAMPLES

Sample # 13 Sampled 1:00 7/17/81

Cadmium, total	0.02	MG/L
Chromium, total	0.1	MG/L
Lead, total	0.5	MG/L
Nickle, total	0.73	MG/L
Mercury, total	L.T. 0.4	MCG/L

Sample # 14 Sampled 1:00 7/17/81

THO 47 MCG/L

RESULTS OF SAMPLES TAKEN AT HOLIDAY PARK

WELL SAMPLES

WELL # 4

Sample # 11(Zimmerman) Sampled 12:00 7/16/81

THO 4 MG/L

Sample # 26 Sampled 11:00 8/12/81

Phenols .008 MG/L

WELL # 8

Sample # 12 (Old Falls) Sampled 12:00 7/16/81

THO 3 MCG/L

Sample # 27 Sampled 11:00 8/12/81

Phenol .01 MG/L

SOIL SAMPLES

Sample # 21 Walch Road Sampled 12:00 7/24/81

THO Less than 10 PPB

NIAGARA SANITATION NASH ROAD SITE (DEC # 932054)

Approx. Scale
1: 3600
(All distances estimated)

25 50 75 0 100yd 100yd 200yd

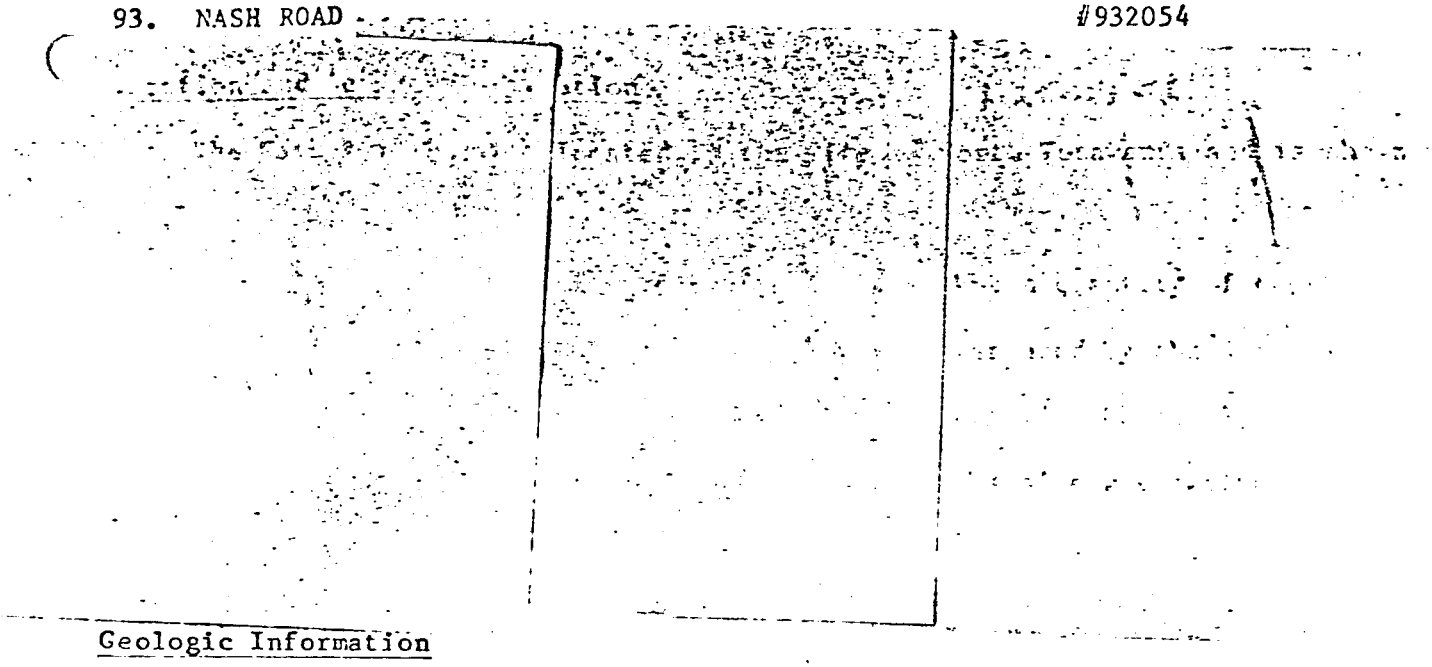
ψ - Marsh Area
{ - Treeline
‖ - Powerlines
L - Red-Brown Leachate stains

Slope - downward toward SE (<1%)

Mapped from field observation only by M. Hopkins NCHD

Michael E. Hopkins

93. NASH ROAD #932054



Geologic Information

The geology of the site consists of a Holocene lacustrine clay unit overlying a bedrock of Camillus Shale. Four test borings were drilled on the site and their locations are shown in figure 1. The geologic description of the borings is as follows:

Well No.	Depth (ft)	Description
1	0 - 5.0	Fill.
	5.0 - 6.5	Clay, pink.
		WATER SAMPLE: 6.0 ft.
2	0 - 8.0	Clay, tan to light green, sandy, dry.
	8.0 - 10.0	Clay, green.
	10.0 - 11.5	Clay, pink.
		SOIL SAMPLE: 8 - 10 ft.
3	0 - 1.5	Tan and black fill.
	1.5 - 3.5	Clay, greenish, sandy, dry.
	3.5 - 7.0	Clay, greenish, sandy, wet.
		SOIL SAMPLE: 7 ft.
4	0 - 1.0	Topsoil.
	1.0 - 3.5	Clay, sandy, dry.
	3.5 - 6.5	Clay, greenish, wet.
		SOIL SAMPLE: 6.5 ft.

Table 1.--Analyses of ground-water and substrate samples from Nash Road, Wheatfield, New York

	Sample number			
	1	2	3	4
Date collected	062482	062482	062482	062482
Depth (ft)	6.0	9.5	7.0	6.5
Sample Type[1]	gw	s	s	s
pH	6.4	-	-	-
Conductivity (uMHOS)	2650	-	-	-
Temperature (°C)	17.0	-	-	-
Inorganic Constituents[2]				
Antimony				
Arsenic	5;5	<1000;<1000	<1000	<1000
Cadmium	1;1	1000;1000	1000	1000
Chromium	<10;<10	2000;4000	2000	2000
Copper	17;21	77000;100000	71000	71000
Iron	90000;90000	2500000;5000000	2100000	2400000
Lead	67;74	20000;20000	13000	20000
Mercury	0.3;0.5	<10;<10	<10	<10
Nickel	34;34	<10000;<10000	<10000	<10000
Selenium				
Zinc				
Flouride				
Sulfide				
Cyanide				
Organic Compounds[2]				
1,2,3-trimethylbenzene[5]	6.2;-[7]	-;-	<300	-
1,2,4-trimethylbenzene[5]	18;-[7]	-;-	<300	-
1,4-dichlorobenzene[5]	7.3;-[7]	-;-	<300	-
(1-methylethyl)benzene[5]	9.3;-[7]	-;-	<300	-
1,3,3-Trimethyl-bicyclo-[2.2.1]heptan-2-one[4]	62;-[7]	-;-	<300	-
1,7,7-Trimethyl-bicyclo-[2.2.1]heptan-2-one[4]	390;17[7]	-;-	<300	-

1 Sample type: gw=ground water, sw=surface water, and s=substrate.
2 Concentrations: ug/L for water and ug/Kg for substrate. Blank spaces indicate that no analyses were performed; dashes indicate that constituents and compounds were not found.
3 Cu(D): analysis done by direct aspiration because of high iron concentration.
4 Identity determined by library match; no standard available. Concentration results are semiquantitative and are based on the response factor of the internal standard.
5 Identity based on less than library match; identification seemed reasonable. As for footnote 4, concentration results are semiquantitative.
6 Volatile found in GC/ms extractions. Concentration results probably less than actual.
7 Low surrogate recoveries.
8 Estimated value less than detection limit.

Table 1.—Analyses of ground-water and substrate samples from Nash Road, Wheatfield, New York

	Sample Number 1	2	3	4
Organic Compounds[2] (continued)				
Iodocyclohexane [5]	-;-	10052;-	-	-
N-[2-methyl-1-(1-methylethyl) butylidiene]methanamine[5]	-;-	36569;-	-	-
N-(2 hydroethyl)-dodecanamide [5]	-;-	16342;-	-	-
1-(2-butenyl)-2,3-dimethylbenzene [5]	-;-	1301;-	-	-
2,3,5,6,7,8,9,10-octahydri-5-hydroxy-2,2,7,7,9-pentamethyl-5,9-menthano-benzocycloocten-4(1H)-one[4]	-;-	6294;-	-	-
10-methylcisosane [4]	-;-	<300;-	-	-
Hexamethylcyclotrisiloxane[5]	-;-	-;-	-	1300
Octamethylcyclotetra-siloxane [5]	-;-	-;-	-	5440
Decamethylcyclopenta-siloxane [5]	-;-	-;-	-	293[8]
Dodecamethylcyclohexa-siloxane [5]	-;-	-;-	-	90.7
5-Methyl-3-hexen-2-one[5]	-;-	-;3500	-	-
Dichloromethylbenzene[5]	-;-	-;<300	-	-
2-(1,1-Dimethyl)-4-methylfuran[5]	-;-	-;183000	-	-
2,4-Dimethyl-2-pentene		-;182000	-	-
3-Octanol[5]		-;47500	-	-
2,6-Bis(1,1-dimethylethyl) napthalene[5]	-;-	-;1650	-	-
1,1,4,5,5,8-Hexamethyl-S-hydrindacene[5]	-;-	-;5750	-	-
Flouranthene	-;-	-;538	-	-
Benz(a)anthracene	-;-	-;272[8]	-	-
Chrysene	-;-	-;274[8]	-	-
Benzo(b)flouranthene	-;-	-;223[8]	-	-
Benzo(k)flouranthene	-;-	-;249[8]	-	-
2,6-Dimethyl-2,5-hepta-dien-4-one[5]	-;-	-;-	509	-
2-Methyl-2-octen-4-one[5]	-;-	-;-	13300	-
1,2,4-Trimethyl-5-(1-methyl-ethenyl)benzene[5]	-;-	-;-	159	-

1 Sample type: gw=ground water, sw=surface water, and s=substrate.
2 Concentrations: ug/L for water and ug/Kg for substrate. Blank spaces indicate that no analyses were performed; dashes indicate that constituents and compounds were not found.
3 Cu(D): analysis done by direct aspiration because of high iron concentration.
4 Identity determined by library match; no standard available. Concentration results are semiquantitative and are based on the response factor of the internal standard.
5 Identity based on less than library match; identification seemed reasonable. As for footnote 4, concentration results are semiquantitative.
6 Volatile found in GC/ms extractions. Concentration results probably less than actual.
7 Low surrogate recoveries.
8 Estimated value less than detection limit.

Table 1.--Analyses of ground-water and substrate samples from Nash Road, Wheatfield, New York--continued

	Sample Number 1,	2	3	4
Organic Compounds[2] (continued)				
1,7,7-Trimethyl-bicyclo-[2.2.1]heptane-2.5-dione[5]	<5;20[7]	-;-	-	-
3-(1,1-dimethylethyl) phenol[5]	20;2.0[8]	-;-	-	-
2-methylbenzochloride[5]	<5;-[7]	-;-	-	-
Diethylphthalate[5]	6.2;8.0[7]	-;-	-	-
Phosphoric acid, tributylester[5]	10;110[7]	-;-	-	-
2(3H)-benzothiazolone[5]	<5;60[7]	-;-	-	-
Di-n-butylphthalate[5]	2.5[8];5.7[7]	-;-	-	-
1,2,3,4,4a,9,10,10a-octahydro-1,4a-dimethyl-7-(1-methyethyl)-[1R-(1 alpha, 4a beta, 10a alpha)]-1-phenanthrenecarboxaldehyde[5]	<5;1.5[8]	-;-	-	-
Cyclohexlphthalate[5]	2.6[8];-[7]	-;-	-	-
3,5-Dimethyl phenol[5]	-;11[7]	-;-	-	-
2-ethyl-4-phenol-.delta. 2-1,3,4-oxadiazolin-5-one[5]	-;100[7]	-;-	-	-
n-butylbenzene sulfonamide[5]	-;9.9[7]	-;-	-	-
3-(2-phenylethyl)phenol[5]	-;2.1[8]	-;-	-	-
2H-1-benzopyran[5]	-;<5[7]	-;-	-	-
2-methylpentadecane[5]	-;<5[7]	-;-	-	-
Heptadecane[5]	-;<5[7]	-;-	-	-
Octacosane[5]	-;<5[7]	-;-	-	-
4,8,12-Trimethyl-3,7,11-tridecatriene-nitrile,4[5]	-;<5[7]	-;-	-	-
Nonadecane[5]	-;<5[7]	-;-	-	-
3,8-Dimethylundecane[5]	-;<5[7]	-;-	-	-
o-methyloxime-3,5-dimethyl-2-cyclohexen-1-one[5]	-;-	804;-	-	-

1 Sample type: gw=ground water, sw=surface water, and s=substrate.
2 Concentrations: ug/L for water and ug/Kg for substrate. Blank spaces indicate that no analyses were performed; dashes indicate that constituents and compounds were not found.
3 Cu(D): analysis done by direct aspiration because of high iron concentration.
4 Identity determined by library match; no standard available. Concentration results are semiquantitative and are based on the response factor of the internal standard.
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6 Volatile found in GC/ms extractions. Concentration results probably less than actual.
7 Low surrogate recoveries.
8 Estimated value less than detection limit.

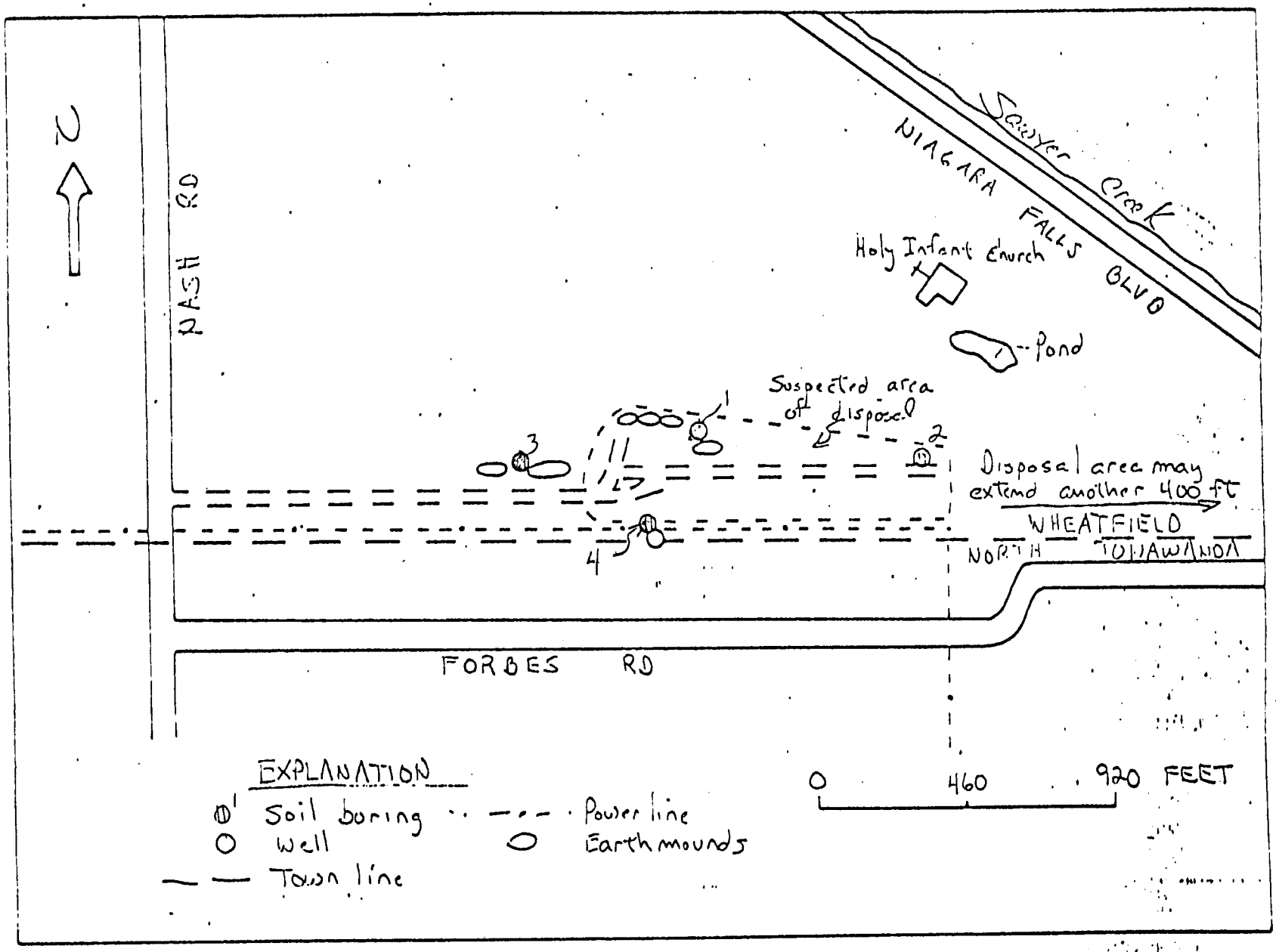
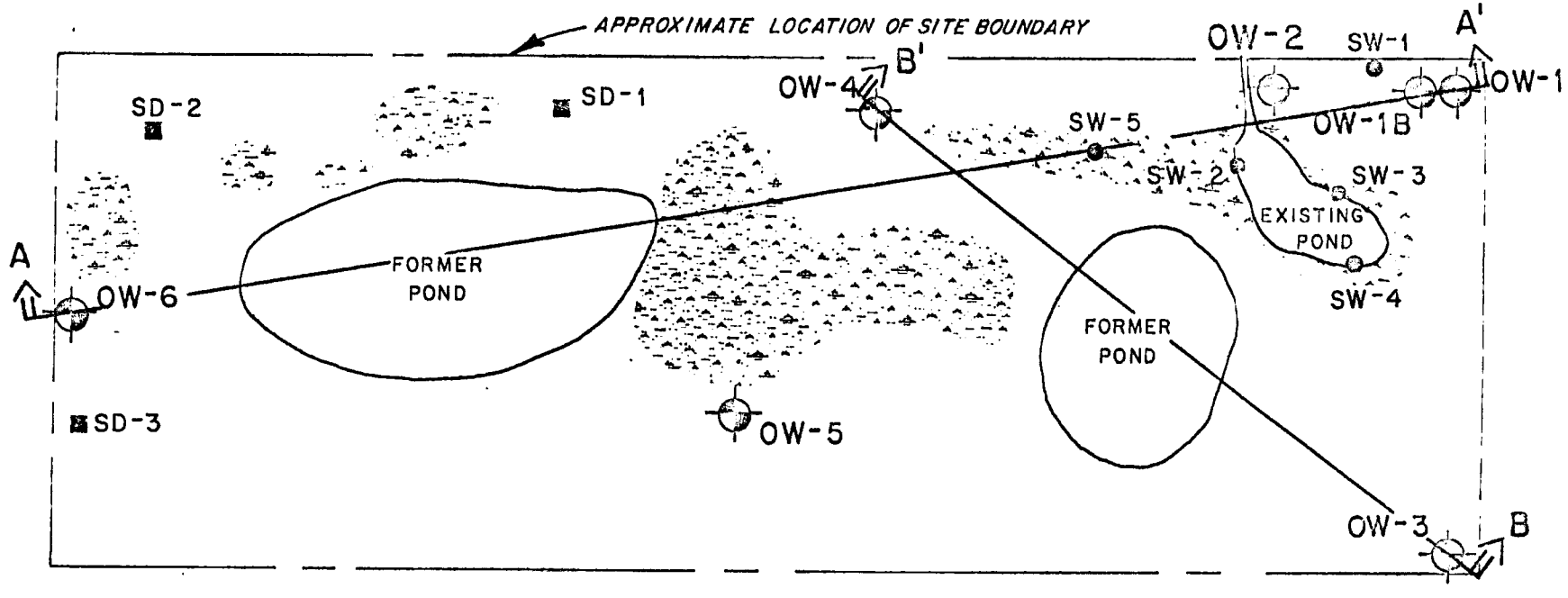


Figure 1. Location of sampling sites on the Nash Road property.

BY D. Tomea DATE 8/3/84



EXPLANATION:

- SEDIMENT SAMPLE
- SURFACE WATER SAMPLE
- SAMPLING WELL OW-1

0 200 400 FEET
SCALE

PLOT PLAN
SHOWING CROSS SECTION LOCATIONS
NASH ROAD SITE

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FIGURE V.iv.1

TABLE IV.1

848J31/36330

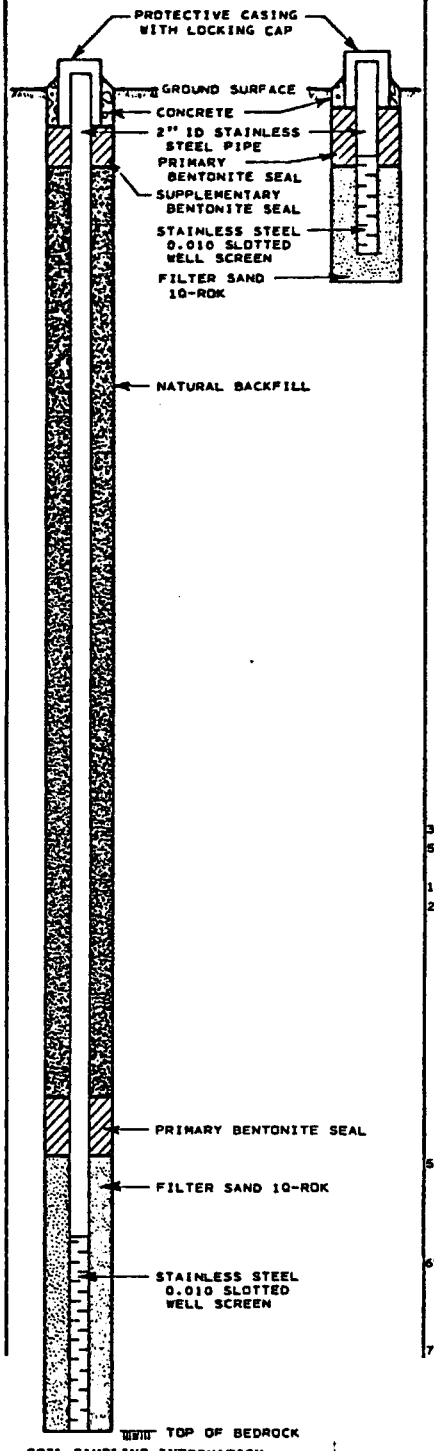
Analytical Results for Surface Water Samples

Parameter	SW-1	SW-2	SW-3	SW-4	SW-5
Methylene Chloride, ug/l	11	<10	10	<10	<10
Chloroform, ug/l	<10	<10	<10	<10	<10
Carbon Tetrachloride, ug/l	<10	<10	<10	<10	<10
Benzene, ug/l	<10	<10	<10	<10	<10
Toluene, ug/l	<10	<10	<10	<10	<10
Chlorobenzene, ug/l	<10	<10	<10	<10	<10
1,1,2-trichloroethane, ug/l	<10	<10	<10	<10	<10
Tetrachloroethane, ug/l	<10	<10	<10	<10	<10
1,1,2,2 - tetrachloroethene, ug/l	<10	<10	<10	<10	<10
Trichloroethene, ug/l	<10	<10	<10	<10	<10
Trichlorobenzene (isomers), ug/l	<10	<10	<10	<10	<10
Dichlorobenzene (isomer), ug/l	<10	<10	<10	<10	<10
Hexchlorobutadiene, ug/l	<10	<10	<10	<10	<10
pH	6.9	8.1	7.1	7.4	7.4
Total organic halogens mg/l	0.010	0.005	0.007	0.007	0.008

BORING OW-1

WELL SCHEMATICS

OW-1B OW-1



BLOW COUNT	SAMPLE NO. & TYPE	RUN NO.	CORE REC	CORE ROD
5	1 S			
15	2 S			
15	3 S			
35	4 S			
15	5 S			
9	6 S			
10	7 S			
2	8 S			
2	9 S			
	10 S			
	11 S			
9	1B:1 S			
4	1B:2 S			
38/6"	1B:3 S			
55/6"	1B:4 S			
16/6"	1B:5 S			
20/6"	1B:6 S			
98	1B:7 S			
55/6"	1B:8 S			
65/6"	1B:9 S			
76/6"	1B:10 S			

SAMPLING — FRACTURES

DEPTH IN FEET: 0, 5, 10, 15, 20, 25, 30, 35, 40, 45, 50, 55, 60, 65

GRAPHIC LOG: ML, CL, CH, GM

DESCRIPTIVE GEOLOGIC NOTES

SURFACE CONDITIONS: GRASSY, WET.

LIGHT BROWN MOIST MEDIUM SILT AND CLAY, TRACE OF SAND, OCCASIONAL BLACK ORGANIC STAINS

GRAY MOIST STIFF LAYERED CLAY AND SILT WITH OCCASIONAL SEAMS OF FINE TO MEDIUM SAND, 1/8" IN THICKNESS

GRADES TO LESS STIFF

GRAY MOIST MEDIUM LAYERED CLAY, RED CLAY LAYERS APPROXIMATELY 1/10" THICKNESS AT IRREGULAR INTERVALS

GRADES TO VERY SOFT CLAY

GRADES TO SOFT

GRADES TO VERY SOFT

BROWN, MOIST SILT AND COARSE TO FINE GRAVEL, LITTLE CLAY, LITTLE FINE SAND (TILL)

GRADES TO WET

GRADES TO MOIST, DENSE SILT, SOME FINE TO COARSE SAND, LITTLE FINE GRAVEL

GRADES TO WET

SOIL SAMPLING INFORMATION

- STANDARD PENETRATION TEST
- UNDISTURBED SAMPLE
- DISTURBED SAMPLE
- NO SAMPLE RECOVERED

ROCK CORE INFORMATION

80 — CORE LOSS ZONE

PERCENT CORE RECOVERY

82 — CORE ROD

FRACTURES

- Zone of core loss
- Breccia zone
- Dip-slip slickensides
- Fractures-shown at approximate angle to core axis
- Mineralized fracture c - calcite s - sulfide
- Fractured zone
- Void

KEY TO WELL SCHEMATIC

- Grout
- Bentonite Seal
- Sand Filter
- Well Screen

DAMES & MOORE

FIGURE B-1A

BORING OW-I

WELL SCHEMATICS	SAMPLING: BLOW COUNT	SAMPLING: SAMPLE NO. & TYPE	SAMPLING: RUN NO.	SAMPLING: CORE REC.	SAMPLING: CORE ROD	FRACTURES	DEPTH IN FEET	GRAPHIC LOG	DESCRIPTIVE GEOLOGIC NOTES
							65		
		1B;11						GM	TOP OF BEDROCK AT 68.6'. BEDROCK IS DOLOSTONE.
							70		BORING TERMINATED AT A DEPTH OF 68.6' ON JUNE 11, 1984.

REV.	DRAWING TITLE	ELEVATION	W.L.	H.C. or W.L.	Q.A.
0	A.S. 7-25-84				
1					
2					
3					

PROJECT D&C Nashua JOB NO. 13306-002A ISSUE DATE

SOIL SAMPLING INFORMATION

- STANDARD PENETRATION TEST
- UNDISTURBED SAMPLE
- DISTURBED SAMPLE
- NO SAMPLE RECOVERED

ROCK CORE INFORMATION

- 80 — CORE LOSS ZONE
- PERCENT CORE RECOVERY
- 82 — CORE ROD

FRACTURES

- Zone of core loss
- Breccia zone
- Dip-slip slickensides
- Fractures-shown at approximate angle to core axis
- Mineralized fracture c = calcite s = sulfide
- Fractured zone
- Void

KEY TO WELL SCHEMATIC

- Grout
- Bentonite Seal
- Sand Filter
- Well Screen

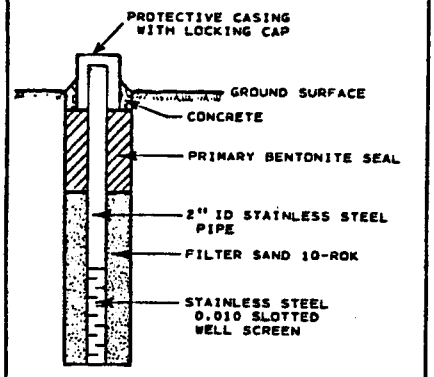
DAMES & MOORE

FIGURE B.1B

BORING OW-2

WELL SCHEMATICS

OW-2



SAMPLING					FRACTURES	DEPTH IN FEET	GRAPHIC LOG
BLOW COUNT	SAMPLE NO. & TYPE	RUN NO.	CORE REC	CORE ROD			
10	1 ⊡					0	ML
11	2 ⊡						SW
13	3 ⊡					5	
34	4 ⊡						CL
18	5 ⊡					10	
5	6 ⊡						CH
3	7 ⊡					15	

DESCRIPTIVE GEOLOGIC NOTES

SURFACE CONDITIONS: GRASSY, MUDDY

LIGHT BROWN MOIST STIFF SILT, LITTLE FINE SAND

GRAY WET MEDIUM DENSE FINE SAND, TRACE SILT

GRAY AND BROWN MOIST STIFF LAYERED CLAY AND SILT; SILT LAYERS ABOUT 1/2" THICK

GRADES TO MEDIUM

GRADES TO SOFT

GRAY MOIST, VERY SOFT LAYERED CLAY; RED CLAY LAYERS ARE APPROXIMATELY 1/8" THICK AT 3/4" INTERVALS

BORING TERMINATED AT A DEPTH OF 14.0' ON JUNE 6, 1984.

PROJECT DEQ, Moab, UT JOB NO. 13305-003

REV.	DRAWING TITLE	DRAWN BY	CHECKED BY	APPROVED BY	DATE
0					
1					
2					
3					

SOIL SAMPLING INFORMATION

- ⊡ STANDARD PENETRATION TEST
- ■ UNDISTURBED SAMPLE
- ⊠ DISTURBED SAMPLE
- □ NO SAMPLE RECOVERED

ROCK CORE INFORMATION

- 80 — CORE LOSS ZONE
- PERCENT CORE RECOVERY
- 82 — CORE ROD

FRACTURES

- Zone of core loss
- Breccia zone
- Dip-slip slickensides
- Fractures shown at approximate angle to core axis
- Mineralized fracture c = calcite s = sulfide
- Fractured zone
- Void

KEY TO WELL SCHEMATIC

- Grout
- Bentonite Seal
- Sand Filter
- Well Screen

DAMES & MOORE

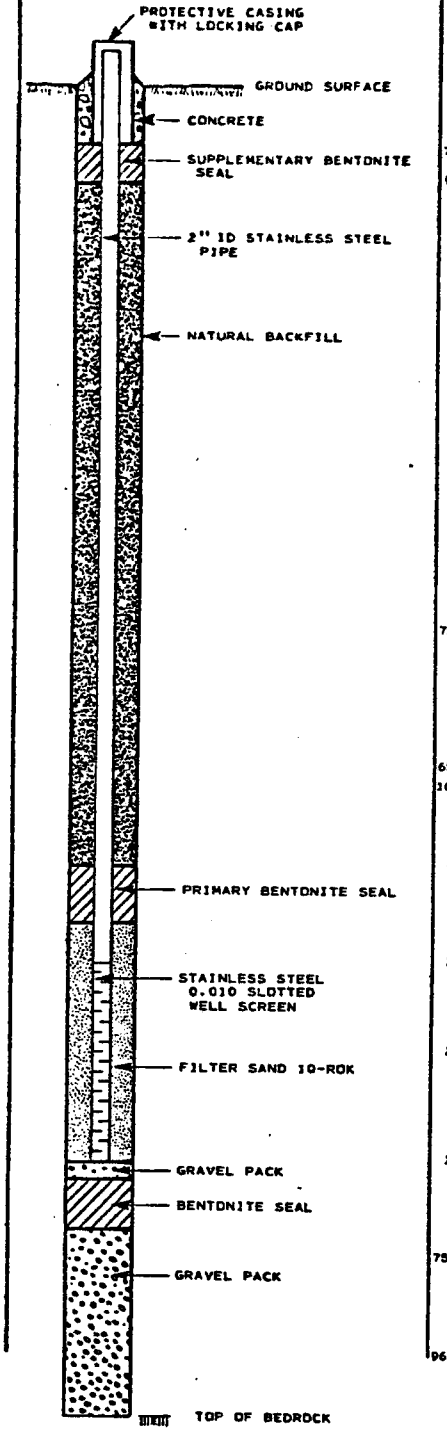
FIGURE B-2

BORING OW-3

SURFACE ELEVATION
COORDINATES

WELL SCHEMATICS

OW-3



SAMPLING					FRACTURES	DEPTH IN FEET	GRAPHIC LOG	DESCRIPTIVE GEOLOGIC NOTES
BLOW COUNT	SAMPLE NO & TYPE	RUN NO	CORE REC	CORE ROD				
								SURFACE CONDITIONS: GRASSY, TALL BRUSH
6	1 S					0		MIXED SAND/WASTE FILL
11	2 S							
7/.5'	3A S							
9/.5'	3B S							
32	4 S					5	CL	GRAY AND BROWN MOIST MEDIUM LAYERED CLAY AND SILT, TRACE FINE SAND, BROWN SILT LAYERS APPROXIMATELY 1/2"-1" IN THICKNESS AT 3 1/2" INTERVALS
20	5 S							GRADES TO STIFF AT 6.0'
7	6 S							GRAY MOIST MEDIUM LAYERED CLAY
6	7 S					10		RED CLAY LAYERS APPROXIMATELY 1/10" THICK AT 1/2" INTERVALS
4	8 S							GRADES TO SOFT WITH OCCASIONAL SILT LAYERS APPROXIMATELY 1/2" THICK AT 10.0'
2	9 S					15	CH	CLAY LAYERS BECOME LESS DISTINCT AT 12.0'
2	10 S							GRADES TO VERY SOFT AT 16.0'
2	11 S					20		
3	12A S					25	CL	GRAY AND BROWN/RED MOIST MEDIUM STIFF LAYERED CLAY AND SILT AT 26.0'
3	12B S							SEAM OF MOIST MEDIUM TO FINE SAND AT 26.3'
72/.5'	13 S							BROWN MOIST MEDIUM SILT AND COARSE TO FINE GRAVEL, TRACE FINE SAND, TRACE CLAY (TILL)
	14 S							GRADES TO DRY AND VERY STIFF SILT AT 28.5'
65/.5'	15 S					30		
100/.4'	16 S					35		GRADES TO MOIST AND HARD SILT
29	17 S					40		GRADES TO MOIST AND MEDIUM
21	18 S					45	GM	GRADES TO WET
23	19 S					50		
17	20 S					55		
75/.5'	21 S					60		GRADES TO COARSE TO FINE GRAVEL AND BROWN DRY HARD SILT, SOME WEATHERED ROCK FRAGMENTS, TRACE FINE SAND
96/.5'	22 S					65		

SOIL SAMPLING INFORMATION

- S STANDARD PENETRATION TEST
- U UNDISTURBED SAMPLE
- D DISTURBED SAMPLE
- N NO SAMPLE RECOVERED

ROCK CORE INFORMATION

- 80 — CORE LOSS ZONE
- PERCENT CORE RECOVERY
- 82 — CORE ROD

2-01-80 PIEZOMETRIC SURFACE & DATE TESTED

FRACTURES

- Zone of core loss
- Breccia zone
- Dip-slip slickensides
- Fractures-shown at approximate angle to core axis
- Mineralized fracture c - calcite s - sulfide
- Fractured zone
- Void

KEY TO WELL SCHEMATIC

- Grout
- Bentonite Seal
- Sand Filter
- Well Screen

DAMES & MOORE

FIGURE B.3A

BORING OW-3

WELL SCHEMATICS	SAMPLING: BLOW COUNT	SAMPLE NO & TYPE	RUN NO	CORE REC.	CORE ROD	FRACTURES	DEPTH IN FEET	GRAPHIC LOG	DESCRIPTIVE GEOLOGIC NOTES
							65	GM	TOP OF BEDROCK 68.7' BEDROCK IS DOLOSTONE BORING TERMINATED AT A DEPTH OF 68.7' ON JUNE 7, 1984.
							70		

PROJECT DEC, Nashua JOB NO. 13305-003 ISSUE DATE

DRAWING NO.	TITLE	T.I.	T.I. SUPERVISOR	W.L.	SIZE OF W.S.	G.A.
REV.	Initial + Date	Initial + Date	Initial + Date	Initial + Date	Initial + Date	Initial + Date
0		6/11/84				
1						
2						
3						

SOIL SAMPLING INFORMATION

- STANDARD PENETRATION TEST
- UNDISTURBED SAMPLE
- DISTURBED SAMPLE
- NO SAMPLE RECOVERED

ROCK CORE INFORMATION

- 80 — CORE LOSS ZONE; PERCENT CORE RECOVERY
- 82 — CORE ROD

FRACTURES

- Zone of core loss
- Breccia zone
- Dip-slip slickensides
- Fractures-shown at approximate angle to core axis
- Mineralized fracture c - calcite s - sulfide
- Fractured zone
- Void

KEY TO WELL SCHEMATIC

- Grout
- Bentonite Seal
- Sand Filter
- Well Screen

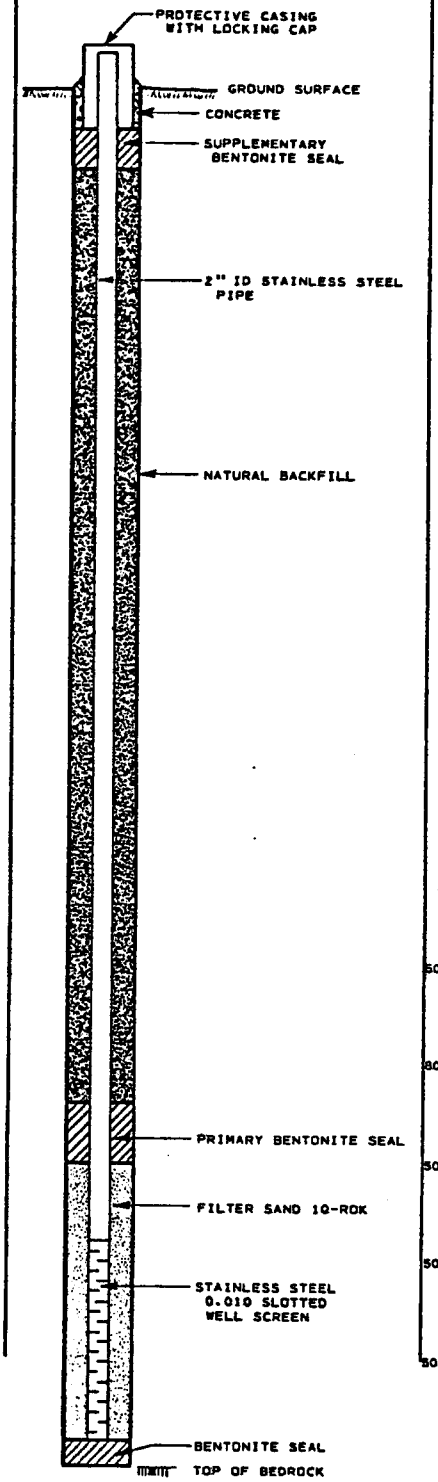
DAMES & MOORE

FIGURE B-28

BORING OW-4

WELL SCHEMATICS

OW-4



SAMPLING					FRACTURES	DEPTH IN FEET	GRAPHIC LOG
BLOW COUNT	SAMPLE NO & TYPE	RUN NO.	CORE REC.	CORE ROD			
22	1 S					0	
15	2 S						
17	3 S					5	ML
33	4 S						SW
10	5 S						
18	6 S					10	CL
16							
8	7 S						
6	8 S						
5	9 S					15	
2	10 S						
3							
2	11 S					20	
2							
2	12 S						
2						25	CH
2	13 S						
2						30	
2	14 S						
2							
26	15 S					35	
46	16						
50/.2'	17 S					40	SW
	18						SP
80/.5'	19 S					45	
50/.5'	20 S						GM
50/.4'	21 S					50	
50/.5'	22 S					55	
						60	
						65	

DESCRIPTIVE GEOLOGIC NOTES

SURFACE CONDITIONS: GRASSY, SOME SURFACE TRASH

MIXED SAND/WASTE FILL

GRAY MOIST SILT AND CLAY

GRAY WET MEDIUM TO FINE SAND, TRACE SILT, ORGANIC ODOR, SOME BLACK STAIN

GRAY AND BROWN MOIST LAYERED SILT AND CLAY, TRACE FINE SAND
LAYERS APPROX. 1/2" THICK

GRADES TO WET BROWN SILT AND CLAY

GRADES TO CLAY, TRACE SILT

BROWN WET SILT AND FINE TO COARSE SAND, LITTLE MEDIUM TO FINE GRAVEL

BROWN WET MEDIUM TO FINE SAND

BROWN MOIST SILT, AND COARSE TO FINE SAND, LITTLE FINE TO COARSE SAND (TILL)

GRADES TO WET

GRADES TO MOIST

SOIL SAMPLING INFORMATION

- S STANDARD PENETRATION TEST
- U UNDISTURBED SAMPLE
- D DISTURBED SAMPLE
- N NO SAMPLE RECOVERED

KEY TO WELL SCHEMATIC

- Grout
- Bentonite Seal
- Sand Filter
- Well Screen

DAMES & MOORE

BORING OW-4

WELL SCHEMATICS	SAMPLING: BLOW COUNT	SAMPLE NO & TYPE	RUN NO	CORE REC	CORE ROD	FRACTURES	DEPTH IN FEET	GRAPHIC LOG
							65	GM
							70	

DESCRIPTIVE GEOLOGIC NOTES

TOP OF BEDROCK 70.3'
BEDROCK IS DOLOSTONE

BORING TERMINATED AT A DEPTH OF 70.3'
ON JUNE 13, 1984.

SOIL SAMPLING INFORMATION

- STANDARD PENETRATION TEST
- UNDISTURBED SAMPLE
- DISTURBED SAMPLE
- NO SAMPLE RECOVERED

ROCK CORE INFORMATION

80 — CORE LOSS ZONE; PERCENT CORE RECOVERY

82 — CORE ROD

FRACTURES

- Zone of core loss
- Breccia zone
- Dip-slip slickensides
- Fractures-shown at approximate angle to core axis
- Mineralized fracture c = calcite s = sulfide
- Fractured zone
- Void

KEY TO WELL SCHEMATIC

- Grout
- Bentonite Seal
- Sand Filter
- Well Screen

DAMES & MOORE

PROJECT ___ JOB NO. ___ ISSUE DATE ___
DRAWING TITLE ___ NO. ___

REV.	E.I. Initial - Date	E.I. SUPERVISOR Initial - Date	R.I. Initial - Date	R.I.C. or P.M. Initial - Date	Q.A. Initial - Date
0					
1					
2					
3					

FIGURE B.4B

BORING OW-5

WELL SCHEMATICS

OW-5

SAMPLING

BLOW COUNT	SAMPLE NO & TYPE	RUN NO.	CORE REC	CORE ROD	FRACTURES
17	1				
11/6"	2				
9/6"	3				
12	4				
29	5				
5	6				
6	7				
2	8				
2	9				
2	10				
2	11				
2	12				
39/5"	13				
50/4"	14				
50/2"	15				
60/4"	16				
65/5"	17				
	18				

DEPTH IN FEET: 0, 5, 10, 15, 20, 25, 30, 35, 40, 45, 50, 55, 60, 65

GRAPHIC LOG: SW, CL, CH, SP, GM

PROTECTIVE CASING WITH LOCKING CAP

GROUND SURFACE

CONCRETE

SUPPLEMENTARY BENTONITE SEAL

2" ID STAINLESS STEEL PIPE

NATURAL BACKFILL

PRIMARY BENTONITE SEAL

FILTER SAND 10-ROK

STAINLESS STEEL 0.010 SLOTTED WELL SCREEN

TOP OF BEDROCK

DESCRIPTIVE GEOLOGIC NOTES

SURFACE CONDITIONS: GRASSY, ATOP FILL

GRAY, WET MEDIUM TO FINE SAND, TRACE SILT

GRADES TO FINE SAND

GRAY AND BROWN MOIST LAYERED CLAY AND SILT, TRACE FINE SAND

SILT LAYERS APPROXIMATELY 1/2" THICK, OCCASIONAL SEAMS OF WET FINE TO MEDIUM SAND APPROXIMATELY 1/8" THICKNESS

GRAY WET SOFT LAYERED CLAY

RED CLAY LAYERS APPROXIMATELY 1/10" THICKNESS AT IRREGULAR INTERVALS

GRADES TO VERY SOFT

RED CLAY LAYERS APPROXIMATELY 1/10" THICKNESS AT 3/4" INTERVALS

BROWN WET LAYERED SILT AND COARSE TO FINE SAND

BROWN WET SILT AND FINE TO COARSE GRAVEL, SOME COARSE TO FINE SAND, TRACE CLAY (TILL)

GRADES TO MOIST

GRADES TO MORE GRAVEL, LESS SILT, DRY

GRADES TO WET SILT, SOME MEDIUM TO FINE GRAVEL, LITTLE WEATHERED BEDROCK FRAGMENTS AT 65.0'

SOIL SAMPLING INFORMATION

- STANDARD PENETRATION TEST
- UNDISTURBED SAMPLE
- DISTURBED SAMPLE
- NO SAMPLE RECOVERED

KEY TO WELL SCHEMATIC

- Grout
- Bentonite Seal
- Sand Filter
- Well Screen

DAMES & MOORE

FIGURE B-5A

BORING OW-5

WELL SCHEMATICS	SAMPLING: BLOW COUNT	SAMPLING: SAMPLE NO & TYPE	SAMPLING: RUN NO.	SAMPLING: CORE REC.	SAMPLING: CORE ROD	FRACTURES	DEPTH IN FEET	GRAPHIC LOG	DESCRIPTIVE GEOLOGIC NOTES
							65	GM	TOP OF DOLOSTONE BEDROCK AT 69.8'
							70		BORING TERMINATED AT A DEPTH OF 70.0' ON JUNE 14, 1984.

PROJECT ____ JOB NO. ____ ISSUE DATE ____

DRAWING TITLE	REV.	D.E. Initial / Date	D.E. SUPERVISOR Initial / Date	P.E. Initial / Date	P.E. or R.E. Initial / Date	Q.A. Initial / Date
	0					
	1					
	2					
	3					

SOIL SAMPLING INFORMATION

- STANDARD PENETRATION TEST
- UNDISTURBED SAMPLE
- DISTURBED SAMPLE
- NO SAMPLE RECOVERED

ROCK CORE INFORMATION

80 — CORE LOSS ZONE

PERCENT CORE RECOVERY

82 — CORE ROD

FRACTURES

- Zone of core loss
- Breccia zone
- Dip-slip slickensides
- Fractures-shown at approximate angle to core axis
- Mineralized fracture c - calcite s - sulfide
- Fractured zone
- Void

KEY TO WELL SCHEMATIC

- Grout
- Bentonite Seal
- Sand Filter
- Well Screen

DAMES & MOORE

FIGURE B.5B

BORING OW-6

WELL SCHEMATICS

OW-6

PROTECTIVE CASING WITH LOCKING CAP

GROUND SURFACE

CONCRETE

SUPPLEMENTARY BENTONITE SEAL

2" ID STAINLESS STEEL PIPE

NATURAL BACKFILL

PRIMARY BENTONITE SEAL

FILTER SAND 10-ROK

STAINLESS STEEL 0.010 SLOTTED WELL SCREEN

TOP OF BEDROCK

SAMPLING					FRACTURES	DEPTH IN FEET	GRAPHIC LOG	DESCRIPTIVE GEOLOGIC NOTES
BLOW COUNT	SAMPLE NO & TYPE	RUN NO	CORE REC	CORE ROD				
						0		SURFACE CONDITIONS: VERY MUDDY WITH STANDING WATER; MARSHY GRASS
								MIXED SAND/WASTE FILL
12	1 ⊡					5	SW	GRAY WET MEDIUM TO FINE SAND, LITTLE SILT, SOME BLACK STAINS
31	2 ⊡							
17	3 ⊡							
41	4 ⊡					10	CL	GRAY AND BROWN MOIST STIFF LAYERED CLAY AND SILT, SILT LAYERS APPROXIMATELY 1/4" THICK AT 1" INTERVALS
15	5 ⊡							GRAY MOIST STIFF CLAY
4	6 ⊡					15		GRADES TO MEDIUM CLAY AT 13.0'
								GRADES TO SOFT AT 15.0'
2	7 ⊡					20		GRAY WET SOFT LAYERED CLAY
								RED CLAY LAYERS APPROXIMATELY 1/2" THICK AT 1 1/2 TO 2" INTERVALS (DETECTABLE ORGANIC ODOR)
2	8 ⊡					25	CH	
2	9 ⊡					30		
2	10 ⊡					35		RED CLAY LAYERS APPROXIMATELY 2" THICK AT 1" INTERVALS AT 35.0'
								TRACE SMALL BLACK MOTTLES OF ORGANIC MATERIAL IN RED LAYERS
2	11 ⊡					40		
39	12 ⊡					45		BROWN DRY MEDIUM SILT, AND MEDIUM TO FINE GRAVEL, TRACE CLAY, TRACE FINE TO COARSE SAND (TILL)
39	13 ⊡					50	GM	GRADES TO MOIST
61/5"	14 ⊡					55		GRADES TO WET, MORE GRAVEL, LESS SILT
55/5"	15 ⊡					60		
						65		

SOIL SAMPLING INFORMATION

- ⊡ STANDARD PENETRATION TEST
- ■ UNDISTURBED SAMPLE
- ⊠ DISTURBED SAMPLE
- □ NO SAMPLE RECOVERED

ROCK CORE INFORMATION

80 — CORE LOSS ZONE; PERCENT CORE RECOVERY

82 — CORE ROD

FRACTURES

- Zone of core loss
- Breccia zone
- Dip-slip slickensides
- Fractures-shown at approximate angle to core axis
- Mineralized fracture c = calcite s = sulfide
- Fractured zone
- Void

KEY TO WELL SCHEMATIC

- Grout
- Bentonite Seal
- Sand Filter
- Well Screen

DAMES & MOORE

FIGURE B.6A

PROJECT SEC Moorhead JOB NO. 13305-003 ISSUE DATE

REV.	DRAWING TITLE	X.I. Initial - Date	X.I. SUPERVISION Initial - Date	R.I. Initial - Date	RIC, or R.M. Initial - Date	Q.A. Initial - Date
0		10/23/86				
1						
2						
3						

BORING OW-6

WELL SCHEMATICS	SAMPLING: BLOW COUNT	SAMPLE NO & TYPE	RUN NO.	CORE REC.	CORE ROD	FRACTURES	DEPTH IN FEET	GRAPHIC LOG	DESCRIPTIVE GEOLOGIC NOTES
							65	PGM	TOP OF BEDROCK 66.0' BEDROCK IS DOLOSTONE BORING TERMINATED AT A DEPTH OF 66.0' ON JUNE 19, 1984.
							70		

PROJECT DEC Nashua JOB NO. 13305-003 ISSUE DATE

DRAWING TITLE	REV.	E.I. Initial - Date	E.I. Supervisor Initial - Date	R.I. Initial - Date	R.I.C. or R.E. Initial - Date	Q.A. Initial - Date
	0	RS 7-26-84				
	1					
	2					
	3					

SOIL SAMPLING INFORMATION

- STANDARD PENETRATION TEST
- UNDISTURBED SAMPLE
- DISTURBED SAMPLE
- NO SAMPLE RECOVERED

ROCK CORE INFORMATION

- 80 — CORE LOSS ZONE; PERCENT CORE RECOVERY
- 82 — CORE ROD

FRACTURES

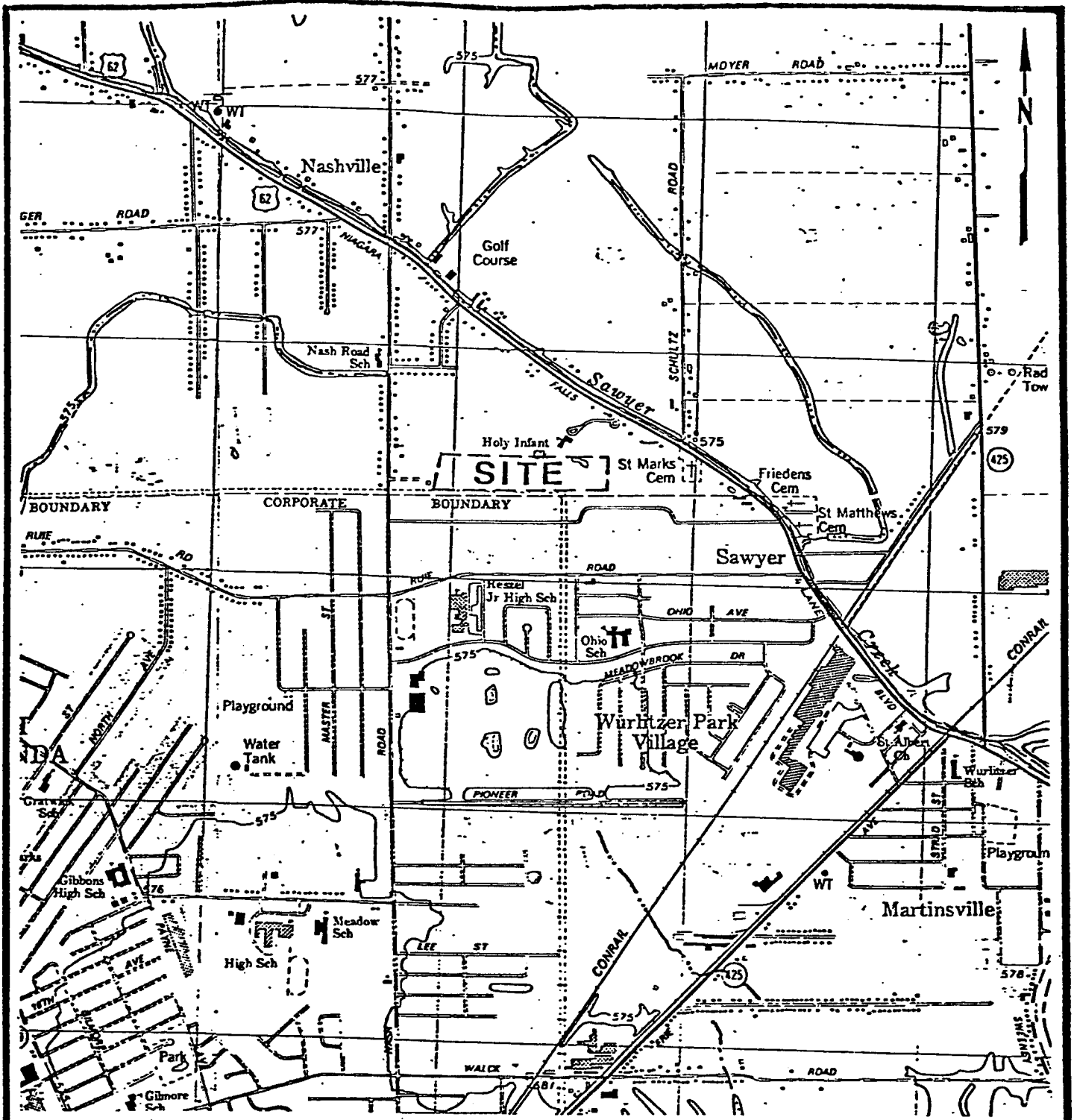
- Zone of core loss
- Breccia zone
- Dip-slip slickensides
- Fractures-shown at approximate angle to core axis
- Mineralized fracture c - calcite s - sulfide
- Fractured zone
- Void

KEY TO WELL SCHEMATIC

- Grout
- Bentonite Seal
- Sand Filter
- Well Screen

DAMES & MOORE

FIGURE B.6B



SITE COORDINATES: 43°04' 10.0" N. LAT
78°51' 33.8" W. LONG

REFERENCE: U.S.G.S. 7.5' TOPOGRAPHIC MAP
TONAWANDA EAST, NY (1980) AND
TONAWANDA WEST, NY (1980) QUADRANGLES

SITE LOCATION MAP
NASH ROAD SITE

DAMES & MOORE

FIGURE I.1

NYD980534820

EPA

POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 1 - SITE LOCATION AND INSPECTION INFORMATION

I. IDENTIFICATION

01 STATE	02 SITE NUMBER
NY	000051436O

II. SITE NAME AND LOCATION

01 SITE NAME (Legal, common, or descriptive name of site)	02 STREET, ROUTE NO., OR SPECIFIC LOCATION IDENTIFIER
Nash Road Landfill	Nash Road

03 CITY	04 STATE	05 ZIP CODE	06 COUNTY	07 COUNTY CODE	08 CONG DIST
Town of Wheatfield	NY	14150	Niagara	63	36

09 COORDINATES LATITUDE	LONGITUDE	10 TYPE OF OWNERSHIP (Check one)
43° 04' 10" 0"	78° 51' 33" 8"	☐ A. PRIVATE ☐ B. FEDERAL ☐ C. STATE ☐ D. COUNTY ☒ E. MUNICIPAL ☐ F. OTHER ☐ G. UNKNOWN

III. INSPECTION INFORMATION

01 DATE OF INSPECTION (MONTH DAY YEAR)	02 SITE STATUS	03 YEARS OF OPERATION
4/28/83	☐ ACTIVE ☒ INACTIVE	1964 (BEGINNING YEAR) 1968 (ENDING YEAR) ☐ UNKNOWN

04 AGENCY PERFORMING INSPECTION (Check all that apply)

☐ A. EPA ☒ B. EPA CONTRACTOR (Name of firm): Engineering Science ☐ C. MUNICIPAL ☐ D. MUNICIPAL CONTRACTOR (Name of firm): ____
☐ E. STATE ☒ F. STATE CONTRACTOR (Name of firm): Dames & Moore ☐ G. OTHER (Specify): ____

05 CHIEF INSPECTOR	06 TITLE	07 ORGANIZATION	08 TELEPHONE NO.
John Kubarewicz	Chemical Engineer	Engineering Science	703/591-7575
09 OTHER INSPECTORS	10 TITLE	11 ORGANIZATION	12 TELEPHONE NO.
Art Seanor	Geologist	Dames & Moore	315/638-2572
			( )
			( )
			( )
			( )

13 SITE REPRESENTATIVES INTERVIEWED	14 TITLE	15 ADDRESS	16 TELEPHONE NO.
Ed Greinert	City Supervisor	Wheatfield	
			( )
			( )
			( )
			( )
			( )

17 ACCESS GAINED BY (Check one)	18 TIME OF INSPECTION	19 WEATHER CONDITIONS
☒ PERMISSION ☐ WARRANT	15:00	sunny

IV. INFORMATION AVAILABLE FROM

01 CONTACT	02 OF (Agency/Organization)	03 TELEPHONE NO.
Ernie Schroeder	Engineering Science	404/325-0770

04 PERSON RESPONSIBLE FOR SITE INSPECTION FORM	05 AGENCY	06 ORGANIZATION	07 TELEPHONE NO.	08 DATE (MONTH DAY YEAR)
Eileen Gilligan		Dames & Moore	315/638-2572	8/10/84

EPA

POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 2 - WASTE INFORMATION

I. IDENTIFICATION

01 STATE	02 SITE NUMBER
NY	0000514380

II. WASTE STATES, QUANTITIES, AND CHARACTERISTICS

01 PHYSICAL STATES (Check all that apply)

- ☑ A. SOLID
- ☐ B. POWDER, FINES
- ☑ C. SLUDGE
- ☐ D. OTHER _____ (Specify)
- ☐ E. SLURRY
- ☑ F. LIQUID
- ☐ G. GAS

02 WASTE QUANTITY AT SITE (Measures of waste quantities must be independent)

- TONS _____
- CUBIC YARDS 1600
- NO. OF DRUMS _____

03 WASTE CHARACTERISTICS (Check all that apply)

- ☑ A. TOXIC
- ☐ B. CORROSIVE
- ☐ C. RADIOACTIVE
- ☐ D. PERSISTENT
- ☐ E. SOLUBLE
- ☑ F. INFECTIOUS
- ☑ G. FLAMMABLE
- ☐ H. IGNITABLE
- ☐ I. HIGHLY VOLATILE
- ☐ J. EXPLOSIVE
- ☐ K. REACTIVE
- ☐ L. INCOMPATIBLE
- ☐ M. NOT APPLICABLE

III. WASTE TYPE

CATEGORY	SUBSTANCE NAME	01 GROSS AMOUNT	02 UNIT OF MEASURE	03 COMMENTS
SLU	SLUDGE			
OLW	OILY WASTE			
SOL	SOLVENTS			
PSD	PESTICIDES			
(OCC)	OTHER ORGANIC CHEMICALS	900 cu. yds.		Chemical waste/ Love Canal
IOC	INORGANIC CHEMICALS			
ACD	ACIDS			
BAS	BASES			
(MES)	HEAVY METALS			lead, chromium, plating sludge

IV. HAZARDOUS SUBSTANCES (See Appendix for most frequently cited CAS Numbers)

01 CATEGORY	02 SUBSTANCE NAME	03 CAS NUMBER	04 STORAGE/DISPOSAL METHOD	05 CONCENTRATION	06 MEASURE OF CONCENTRATION
MES	lead	999	landfill	67-20,000	ppb
OCC	2,4, dimethyl 2 pentene	999	landfill	182,000	ppb
OCC	2-(1,1 dimethyl)-4-	999	landfill	183,000	ppb
OCC	methylfuran		landfill	-	-
OCC	phenol	108-95-2	landfill	1,000	mg/l
MES	mercury	7439-97-6	landfill	0.5	ppb
SOL	benzene	71432	landfill		
SOL	toluene	108883	landfill	-	-
SOL	methylene chloride	999	landfill	-	-
OCC	dichlorobenzene	25321-226	landfill	-	-
OCC	tetrachloride	999	landfill	-	-
OCC	trichloroethane	127184	landfill	-	-
OCC	trichloroethene	999	landfill	-	-
OCC	hexachlorobutadiene	87683	landfill	-	-

V. FEEDSTOCKS (See Appendix for CAS Numbers)

CATEGORY	01 FEEDSTOCK NAME	02 CAS NUMBER	CATEGORY	01 FEEDSTOCK NAME	02 CAS NUMBER
FDS	mercury	7439-97-6	FDS		
FDS			FDS		
FDS			FDS		
FDS			FDS		

VI. SOURCES OF INFORMATION (Cite specific references, e.g., state files, sample analysis, reports)

1.) Investigation of Selected Inactive Toxic Landfills in conjunction with the Niagara River Study," Aug. 1981, (U.S.G.S.)
2.) Memo to Hennesey NYSDOT, 8/9/78
3.) Letter to Caine NYSDOT from Hooker, 5/9/68

EPA

POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 3 - DESCRIPTION OF HAZARDOUS CONDITIONS AND INCIDENT

I. IDENTIFICATION
01 STATE: NY | 02 SITE NUMBER: 0000 514 380

II. HAZARDOUS CONDITIONS AND INCIDENTS

01 ☒ A. GROUNDWATER CONTAMINATION | 02 ☒ OBSERVED (DATE: 7/24/81) | ☐ POTENTIAL | ☐ ALLEGED
03 POPULATION POTENTIALLY AFFECTED: _____ | 04 NARRATIVE DESCRIPTION

Well sampling shows contamination by lead and organic chemicals. Other analyses pending.

01 ☒ B. SURFACE WATER CONTAMINATION | 02 ☒ OBSERVED (DATE: 7/83) | ☐ POTENTIAL | ☐ ALLEGED
03 POPULATION POTENTIALLY AFFECTED: _____ | 04 NARRATIVE DESCRIPTION

Rust colored red stains in standing water and soil. Chemical analyses show low levels of methylene chloride and TOX.

01 ☐ C. CONTAMINATION OF AIR | 02 ☒ OBSERVED (DATE: 7/84) | ☐ POTENTIAL | ☐ ALLEGED
03 POPULATION POTENTIALLY AFFECTED: _____ | 04 NARRATIVE DESCRIPTION

None.

01 ☐ D. FIRE/EXPLOSIVE CONDITIONS | 02 ☒ OBSERVED (DATE: 7/84) | ☐ POTENTIAL | ☐ ALLEGED
03 POPULATION POTENTIALLY AFFECTED: _____ | 04 NARRATIVE DESCRIPTION

Small fire of unknown origin burning unattended.

01 ☒ E. DIRECT CONTACT | 02 ☒ OBSERVED (DATE: 7/84) | ☒ POTENTIAL | ☐ ALLEGED
03 POPULATION POTENTIALLY AFFECTED: ~100 | 04 NARRATIVE DESCRIPTION

Site used by local residents as play area.

01 ☒ F. CONTAMINATION OF SOIL | 02 ☒ OBSERVED (DATE: 7/24/81) | ☐ POTENTIAL | ☐ ALLEGED
03 AREA POTENTIALLY AFFECTED: _____ | 04 NARRATIVE DESCRIPTION

Soil samples show metal and organic contamination. Other analyses pending.

01 ☐ G. DRINKING WATER CONTAMINATION | 02 ☐ OBSERVED (DATE: _____) | ☒ POTENTIAL | ☐ ALLEGED
03 POPULATION POTENTIALLY AFFECTED: _____ | 04 NARRATIVE DESCRIPTION

No.

01 ☐ H. WORKER EXPOSURE/INJURY | 02 ☐ OBSERVED (DATE: _____) | ☐ POTENTIAL | ☐ ALLEGED
03 WORKERS POTENTIALLY AFFECTED: _____ | 04 NARRATIVE DESCRIPTION

None.

01 ☐ I. POPULATION EXPOSURE/INJURY | 02 ☐ OBSERVED (DATE: _____) | ☒ POTENTIAL | ☐ ALLEGED
03 POPULATION POTENTIALLY AFFECTED: ~100 | 04 NARRATIVE DESCRIPTION

No known injuries.

EPA

POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 3 - DESCRIPTION OF HAZARDOUS CONDITIONS AND INCIDENTS

I. IDENTIFICATION
01 STATE: NY | 02 SITE NUMBER: 0000514380

II. HAZARDOUS CONDITIONS AND INCIDENTS (Continued)

01 ☑ J. DAMAGE TO FLORA — 02 ☑ OBSERVED (DATE: 7/84) ☐ POTENTIAL ☐ ALLEGED
04 NARRATIVE DESCRIPTION

None observed.

01 ☐ K. DAMAGE TO FAUNA — 02 ☑ OBSERVED (DATE: 7/84) ☑ POTENTIAL ☐ ALLEGED
04 NARRATIVE DESCRIPTION (Include number of species)

Abundant small animal wildlife on site. No damage observed.

01 ☐ L. CONTAMINATION OF FOOD CHAIN — 02 ☐ OBSERVED (DATE:) ☑ POTENTIAL ☐ ALLEGED
04 NARRATIVE DESCRIPTION

Potential to aquatic microorganisms in ponds and trenches

01 ☑ M. UNSTABLE CONTAINMENT OF WASTES (Spills/Runoff/Standing liquids, Leaking drums) — 02 ☑ OBSERVED (DATE: 4/28/83) POTENTIAL ☐ ALLEGED
03 POPULATION POTENTIALLY AFFECTED: — 04 NARRATIVE DESCRIPTION 7/83

Pools of orange tinted standing water observed, rubbish protruding from earth.

01 ☐ N. DAMAGE TO OFFSITE PROPERTY — 02 ☐ OBSERVED (DATE:) ☐ POTENTIAL ☐ ALLEGED
04 NARRATIVE DESCRIPTION

None.

01 ☐ O. CONTAMINATION OF SEWERS, STORM DRAINS, WWTPs — 02 ☐ OBSERVED (DATE:) ☐ POTENTIAL ☐ ALLEGED
04 NARRATIVE DESCRIPTION

None.

01 ☑ P. ILLEGAL/UNAUTHORIZED DUMPING — 02 ☑ OBSERVED (DATE: 6/11/81) ☐ POTENTIAL ☐ ALLEGED
04 NARRATIVE DESCRIPTION

Niagara County DOH observed "evidence of dumping" after site closed.

05 DESCRIPTION OF ANY OTHER KNOWN, POTENTIAL, OR ALLEGED HAZARDS

III. TOTAL POPULATION POTENTIALLY AFFECTED: unknown

IV. COMMENTS

Per NYSDEC instruction, Phase II study did not address extent of contamination. Therefore, total population potentially affected cannot be determined.

V. SOURCES OF INFORMATION (Cite specific references, e. g., state files, sample analysis, reports)

1.) Niagara County DOH 1981
2.) U.S.G.S. Study, 1982/83
3.) Site visits during Phase II investigations

EPA

POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION
PART 4 - PERMIT AND DESCRIPTIVE INFORMATION

I. IDENTIFICATION

01 STATE	02 SITE NUMBER
NY	0000514380

II. PERMIT INFORMATION

01 TYPE OF PERMIT ISSUED (Check all that apply)	02 PERMIT NUMBER	03 DATE ISSUED	04 EXPIRATION DATE	05 COMMENTS
☐ A. NPDES	Not applicable			
☐ B. UIC				
☐ C. AIR				
☐ D. RCRA				
☐ E. RCRA INTERIM STATUS				
☐ F. SPCC PLAN				
☐ G. STATE (Specify)				
☐ H. LOCAL (Specify)				
☐ I. OTHER (Specify)				
☐ J. NONE				

III. SITE DESCRIPTION

01 STORAGE/DISPOSAL (Check all that apply)	02 AMOUNT	03 UNIT OF MEASURE
☐ A. SURFACE IMPOUNDMENT		
☐ B. PILES		
☐ C. DRUMS, ABOVE GROUND		
☐ D. TANK, ABOVE GROUND		
☐ E. TANK, BELOW GROUND		
☑ F. LANDFILL	unknown	
☐ G. LANDFARM		
☐ H. OPEN DUMP		
☐ I. OTHER (Specify)		

04 TREATMENT (Check all that apply)

- ☐ A. INCINERATION
- ☐ B. UNDERGROUND INJECTION
- ☐ C. CHEMICAL/PHYSICAL
- ☐ D. BIOLOGICAL
- ☐ E. WASTE OIL PROCESSING
- ☐ F. SOLVENT RECOVERY
- ☐ G. OTHER RECYCLING/RECOVERY
- ☑ H. OTHER None (Specify)

05 OTHER

- ☐ A. BUILDINGS ON SITE

06 AREA OF SITE

7 (Acres)

07 COMMENTS

Poorly closed; tires, metal, other rubbish visible

IV. CONTAINMENT

01 CONTAINMENT OF WASTES (Check one)

☐ A. ADEQUATE, SECURE ☐ B. MODERATE ☐ C. INADEQUATE, POOR ☑ D. INSECURE, UNSOUND, DANGEROUS

02 DESCRIPTION OF DRUMS, DIKING, LINERS, BARRIERS, ETC.

1.) Poorly closed; tires, metal, other rubbish visible.
2.) Disposal trench for Love Canal waste excavated in soft, layered clay. No engineered barriers installed.

V. ACCESSIBILITY

01 WASTE EASILY ACCESSIBLE: ☑ YES ☐ NO

02 COMMENTS

Unfenced, easy access

VI. SOURCES OF INFORMATION (Cite specific references, e.g. state files, sample analysis, reports)

1.) Site inspection, summer 1983
2.) Memo to Hennesey NYSDOT, 8/9/84

EPA

POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 5 - WATER, DEMOGRAPHIC, AND ENVIRONMENTAL DATA

I. IDENTIFICATION
01 STATE: NY | 02 SITE NUMBER: 0000514380

II. DRINKING WATER SUPPLY

01 TYPE OF DRINKING SUPPLY (Check as appropriate)	SURFACE	WELL	02 STATUS: ENDANGERED	AFFECTED	MONITORED	03 DISTANCE TO SITE
COMMUNITY	A. ☑	B. ☐	A. ☐	B. ☐	C. ☐	A. _____ (mi)
NON-COMMUNITY	C. ☐	D. ☐	D. ☐	E. ☐	F. ☐	B. _____ (mi)

III. GROUNDWATER

01 GROUNDWATER USE IN VICINITY (Check one)

☐ A. ONLY SOURCE FOR DRINKING ☐ B. DRINKING (Other sources available) COMMERCIAL, INDUSTRIAL, IRRIGATION (No other sources available) ☐ C. COMMERCIAL, INDUSTRIAL, IRRIGATION (Other sources available) ☑ D. NOT USED, UNUSEABLE

02 POPULATION SERVED BY GROUND WATER: 0

03 DISTANCE TO NEAREST DRINKING WATER WELL: 0.2 (mi)

04 DEPTH TO GROUNDWATER	05 DIRECTION OF GROUNDWATER FLOW	06 DEPTH TO AQUIFER OF CONCERN	07 POTENTIAL YIELD OF AQUIFER	08 SOLE SOURCE AQUIFER
4.0 (ft)	SW, S, SE	~4.0 (ft)	_____ (gpd)	☐ YES ☑ NO

09 DESCRIPTION OF WELLS (Including use, depth, and location relative to population and buildings)

Network of sampling wells varying from 10' to 70' in depth located throughout the landfill

10 RECHARGE AREA		11 DISCHARGE AREA	
☑ YES ☐ NO	COMMENTS	☐ YES ☑ NO	COMMENTS

IV. SURFACE WATER

01 SURFACE WATER USE (Check one)

☑ A. RESERVOIR, RECREATION DRINKING WATER SOURCE ☑ B. IRRIGATION, ECONOMICALLY IMPORTANT RESOURCES ☐ C. COMMERCIAL, INDUSTRIAL ☐ D. NOT CURRENTLY USED

02 AFFECTED/POTENTIALLY AFFECTED BODIES OF WATER

NAME:	AFFECTED	DISTANCE TO SITE
small pond on site		
Sawyer Creek		0.25 (mi)
Bull Creek		1.1 (mi)
Tonawanda Creek		2.3 (mi)

V. DEMOGRAPHIC AND PROPERTY INFORMATION

01 TOTAL POPULATION WITHIN

ONE (1) MILE OF SITE	TWO (2) MILES OF SITE	THREE (3) MILES OF SITE
A. 1,800 NO. OF PERSONS	B. 6,100 NO. OF PERSONS	C. 12,000 NO. OF PERSONS

02 DISTANCE TO NEAREST POPULATION: 350 '

03 NUMBER OF BUILDINGS WITHIN TWO (2) MILES OF SITE	04 DISTANCE TO NEAREST OFF-SITE BUILDING
1620	350'

05 POPULATION WITHIN VICINITY OF SITE (Provide narrative description of nature of population within vicinity of site, e.g., rural, village, densely populated urban area)

Site is located adjacent to a suburban housing development.

EPA

POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 5 - WATER, DEMOGRAPHIC, AND ENVIRONMENTAL DATA

I. IDENTIFICATION
01 STATE | 02 SITE NUMBER
NY 000514 380

VI. ENVIRONMENTAL INFORMATION

01 PERMEABILITY OF UNSATURATED ZONE (Check one)

☐ A. $10^{-6} - 10^{-8}$ cm/sec ☐ B. $10^{-4} - 10^{-6}$ cm/sec ☑ C. $10^{-4} - 10^{-3}$ cm/sec ☐ D. GREATER THAN 10^{-3} cm/sec

02 PERMEABILITY OF BEDROCK (Check one)

☐ A. IMPERMEABLE (Less than 10^{-6} cm/sec) ☐ B. RELATIVELY IMPERMEABLE ($10^{-4} - 10^{-6}$ cm/sec) ☑ C. RELATIVELY PERMEABLE ($10^{-2} - 10^{-4}$ cm/sec) ☐ D. VERY PERMEABLE (Greater than 10^{-2} cm/sec)

03 DEPTH TO BEDROCK	04 DEPTH OF CONTAMINATED SOIL ZONE	05 SOIL pH	
~ 70 (ft)	unknown (ft)	5.6-7.3	

06 NET PRECIPITATION	07 ONE YEAR 24 HOUR RAINFALL	08 SLOPE: SITE SLOPE	DIRECTION OF SITE SLOPE	TERRAIN AVERAGE SLOPE
40 - 27 = 13 (in)	2.1 (in)	~ 0 %	~ E	1.0 %

09 FLOOD POTENTIAL
SITE IS IN 7,500 YEAR FLOODPLAIN

10
☐ SITE IS ON BARRIER ISLAND, COASTAL HIGH HAZARD AREA, RIVERINE FLOODWAY

11 DISTANCE TO WETLANDS (5 acre minimum)

ESTUARINE	OTHER
A. (mi)	B. 3.5 (mi)

12 DISTANCE TO CRITICAL HABITAT (of endangered species)
3.5 (mi)
ENDANGERED SPECIES: Peregrine Falcon, Golden Eagl

13 LAND USE IN VICINITY

DISTANCE TO:

COMMERCIAL/INDUSTRIAL	RESIDENTIAL AREAS; NATIONAL/STATE PARKS, FORESTS, OR WILDLIFE RESERVES	AGRICULTURAL LANDS: PRIME AG LAND	AG LAND
A. (mi)	B. 0.01 (mi)	C. (mi)	D. 0.01 (mi)

14 DESCRIPTION OF SITE IN RELATION TO SURROUNDING TOPOGRAPHY

Site is located in a flat, poorly drained area. Prior to dumping, site was a swamp, with drainage to the North.

VII. SOURCES OF INFORMATION (Cite specific references, e.g., state files, sampling reports)

1.) U.S.G.S. Study
2.) DEC site Dossier
3.) Phase II Investigation

EPA

POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 6 - SAMPLE AND FIELD INFORMATION

I. IDENTIFICATION
01 STATE: NY | 02 SITE NUMBER: 0000514380

II. SAMPLES TAKEN

SAMPLE TYPE	01 NUMBER OF SAMPLES TAKEN	02 SAMPLES SENT TO	03 ESTIMATED DATE RESULTS AVAILABLE
GROUNDWATER	8	Compu Chem	8/84
SURFACE WATER	5	ES laboratory	presently available
WASTE			
AIR			
RUNOFF			
SPILL			
SOIL			
VEGETATION			
OTHER sediment	3	Compu Chem	8/84

III. FIELD MEASUREMENTS TAKEN

01 TYPE	02 COMMENTS
Downhole gamma logging	Performed in wells to define soil stratigraphy
Geophysical survey	Performed to locate disposal trench boundaries
Permeability testing	Performed in wells to evaluate rate of contaminant movement

IV. PHOTOGRAPHS AND MAPS

01 TYPE ☒ GROUND ☐ AERIAL

02 IN CUSTODY OF: Dames & Moore office
(Name of organization or individual)

03 MAPS ☒ YES ☐ NO

04 LOCATION OF MAPS: Dames & Moore office

V. OTHER FIELD DATA COLLECTED (Provide narrative description)

Soil samples were collected during the drilling of the seven sampling wells. Grain size analyses of selected samples were performed in the laboratory.

VI. SOURCES OF INFORMATION (Cite specific references, e.g., state files, sample analysis, reports)

Phase II investigation

EPA

POTENTIAL HAZARDOUS WASTE SITE SITE INSPECTION REPORT PART 7 - OWNER INFORMATION

I. IDENTIFICATION	
01 STATE	02 SITE NUMBER
NY	0000514380

II. CURRENT OWNER(S)

01 NAME	02 D+B NUMBER		
Town of Wheatfield			
03 STREET ADDRESS (P.O. Box, RFD #, etc.)		04 SIC CODE	
2800 Church Road			
05 CITY	06 STATE	07 ZIP CODE	
N.Tonawanda	NY	14120	
01 NAME	02 D+B NUMBER		
03 STREET ADDRESS (P.O. Box, RFD #, etc.)		04 SIC CODE	
05 CITY	06 STATE	07 ZIP CODE	
01 NAME	02 D+B NUMBER		
03 STREET ADDRESS (P.O. Box, RFD #, etc.)		04 SIC CODE	
05 CITY	06 STATE	07 ZIP CODE	
01 NAME	02 D+B NUMBER		
03 STREET ADDRESS (P.O. Box, RFD #, etc.)		04 SIC CODE	
05 CITY	06 STATE	07 ZIP CODE	

PARENT COMPANY (If applicable)

08 NAME	09 D+B NUMBER	
10 STREET ADDRESS (P.O. Box, RFD #, etc.)	11 SIC CODE	
12 CITY	13 STATE	14 ZIP CODE
08 NAME	09 D+B NUMBER	
10 STREET ADDRESS (P.O. Box, RFD #, etc.)	11 SIC CODE	
12 CITY	13 STATE	14 ZIP CODE
08 NAME	09 D+B NUMBER	
10 STREET ADDRESS (P.O. Box, RFD #, etc.)	11 SIC CODE	
12 CITY	13 STATE	14 ZIP CODE
08 NAME	09 D+B NUMBER	
10 STREET ADDRESS (P.O. Box, RFD #, etc.)	11 SIC CODE	
12 CITY	13 STATE	14 ZIP CODE

III. PREVIOUS OWNER(S) (List most recent first)

01 NAME	02 D+B NUMBER	
03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE	
05 CITY	06 STATE	07 ZIP CODE
01 NAME	02 D+B NUMBER	
03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE	
05 CITY	06 STATE	07 ZIP CODE
01 NAME	02 D+B NUMBER	
03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE	
05 CITY	06 STATE	07 ZIP CODE

IV. REALTY OWNER(S) (If applicable; list most recent first)

01 NAME	02 D+B NUMBER	
03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE	
05 CITY	06 STATE	07 ZIP CODE
01 NAME	02 D+B NUMBER	
03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE	
05 CITY	06 STATE	07 ZIP CODE
01 NAME	02 D+B NUMBER	
03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE	
05 CITY	06 STATE	07 ZIP CODE

V. SOURCES OF INFORMATION (Cite specific references, e.g., state files, sample analysis, reports)

New York State Tax Records

EPA

POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 8 - OPERATOR INFORMATION

I. IDENTIFICATION

01 STATE	02 SITE NUMBER
NY	0000514380

II. CURRENT OPERATOR (Provide if different from owner)

01 NAME	02 D+B NUMBER	OPERATOR'S PARENT COMPANY (If applicable) 10 NAME	11 D+B NUMBER
None.			
03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE	12 STREET ADDRESS (P.O. Box, RFD #, etc.)	13 SIC CODE
05 CITY	06 STATE / 07 ZIP CODE	14 CITY	15 STATE / 16 ZIP CODE
08 YEARS OF OPERATION	09 NAME OF OWNER		

III. PREVIOUS OPERATOR(S) (List most recent first; provide only if different from owner)

01 NAME	02 D+B NUMBER	PREVIOUS OPERATORS' PARENT COMPANIES (If applicable) 10 NAME	11 D+B NUMBER
Niagara Sanitation Co.			
03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE	12 STREET ADDRESS (P.O. Box, RFD #, etc.)	13 SIC CODE
05 CITY	06 STATE / 07 ZIP CODE	14 CITY	15 STATE / 16 ZIP CODE
N. Tonawanda	NY		
08 YEARS OF OPERATION	09 NAME OF OWNER DURING THIS PERIOD		
1964-1968			
01 NAME	02 D+B NUMBER	10 NAME	11 D+B NUMBER
03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE	12 STREET ADDRESS (P.O. Box, RFD #, etc.)	13 SIC CODE
05 CITY	06 STATE / 07 ZIP CODE	14 CITY	15 STATE / 16 ZIP CODE
08 YEARS OF OPERATION	09 NAME OF OWNER DURING THIS PERIOD		
01 NAME	02 D+B NUMBER	10 NAME	11 D+B NUMBER
03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE	12 STREET ADDRESS (P.O. Box, RFD #, etc.)	13 SIC CODE
05 CITY	06 STATE / 07 ZIP CODE	14 CITY	15 STATE / 16 ZIP CODE
08 YEARS OF OPERATION	09 NAME OF OWNER DURING THIS PERIOD		

IV. SOURCES OF INFORMATION (Cite specific references, e.g., state files, sample analysis, reports)

Niagara County Department of Health, 1981

EPA

POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 9 - GENERATOR/TRANSPORTER INFORMATION

I. IDENTIFICATION
01 STATE | 02 SITE NUMBER
NY 0000514380

II. ON-SITE GENERATOR

01 NAME	02 D+B NUMBER
None.	
03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE
05 CITY	06 STATE / 07 ZIP CODE

III. OFF-SITE GENERATOR(S)

01 NAME	02 D+B NUMBER	01 NAME	02 D+B NUMBER
Hooker Chemical		Niagara Falls Air Force Base	
03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE	03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE
05 CITY	06 STATE / 07 ZIP CODE	05 CITY	06 STATE / 07 ZIP CODE
Niagara Falls	NY	Niagara Falls	NY
01 NAME	02 D+B NUMBER	01 NAME	02 D+B NUMBER
Bell Aerospace		Canborumdum	
03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE	03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE
		Buffalo Ave	
05 CITY	06 STATE / 07 ZIP CODE	05 CITY	06 STATE / 07 ZIP CODE
		Niagara Falls	NY

IV. TRANSPORTER(S)

01 NAME	02 D+B NUMBER	01 NAME	02 D+B NUMBER
Niagara Sanitation Co.			
03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE	03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE
05 CITY	06 STATE / 07 ZIP CODE	05 CITY	06 STATE / 07 ZIP CODE
N. Tonawanda	NY		?
01 NAME	02 D+B NUMBER	01 NAME	02 D+B NUMBER
03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE	03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE
05 CITY	06 STATE / 07 ZIP CODE	05 CITY	06 STATE / 07 ZIP CODE

V. SOURCES OF INFORMATION (Cite specific references, e.g., state files, sample analysis, reports)

Other off-site generator: Frontier Chemical

EPA

POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 10 - PAST RESPONSE ACTIVITIES

I. IDENTIFICATION
01. STATE | 02. SITE NUMBER
NY 0000514380

II. PAST RESPONSE ACTIVITIES

01 ☐ A. WATER SUPPLY CLOSED — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION
No.

01 ☐ B. TEMPORARY WATER SUPPLY PROVIDED — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION
No.

01 ☐ C. PERMANENT WATER SUPPLY PROVIDED — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION
No.

01 ☐ D. SPILLED MATERIAL REMOVED — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION
No.

01 ☐ E. CONTAMINATED SOIL REMOVED — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION
No.

01 ☐ F. WASTE REPACKAGED — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION
No.

01 ☐ G. WASTE DISPOSED ELSEWHERE — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION
No.

01 ☐ H. ON SITE BURIAL — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION
No.

01 ☐ I. IN SITU CHEMICAL TREATMENT — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION
No.

01 ☐ J. IN SITU BIOLOGICAL TREATMENT — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION
No.

01 ☐ K. IN SITU PHYSICAL TREATMENT — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION
No.

01 ☐ L. ENCAPSULATION — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION
No.

01 ☐ M. EMERGENCY WASTE TREATMENT — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION
No.

01 ☐ N. CUTOFF WALLS — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION
No.

01 ☐ O. EMERGENCY DIKING/SURFACE WATER DIVERSION — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION
No.

01 ☐ P. CUTOFF TRENCHES/SUMP — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION
No.

01 ☐ Q. SUBSURFACE CUTOFF WALL — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION
No.

EPA

POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 10 - PAST RESPONSE ACTIVITIES

I. IDENTIFICATION
01 STATE | 02 SITE NUMBER
NY 0000514380

II. PAST RESPONSE ACTIVITIES (Continued)

01 ☐ R. BARRIER WALLS CONSTRUCTED — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION
No.

01 ☐ S. CAPPING/COVERING — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION
Incomplete cover of waste (trash)

01 ☐ T. BULK TANKAGE REPAIRED — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION
No.

01 ☐ U. GROUT CURTAIN CONSTRUCTED — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION
No.

01 ☐ V. BOTTOM SEALED — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION
No.

01 ☐ W. GAS CONTROL — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION
No.

01 ☐ X. FIRE CONTROL — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION
No.

01 ☐ Y. LEACHATE TREATMENT — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION
No.

01 ☐ Z. AREA EVACUATED — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION
No.

01 ☐ 1. ACCESS TO SITE RESTRICTED — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION
No. Site is surrounded by incomplete (although locked) fence.

01 ☐ 2. POPULATION RELOCATED — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION
No.

01 ☐ 3. OTHER REMEDIAL ACTIVITIES — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION
None.

III. SOURCES OF INFORMATION (Cite specific references, e.g., state files, sample analysis, reports)

Site visits during Phase II investigation

EPA

POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 11 - ENFORCEMENT INFORMATION

I. IDENTIFICATION

01 STATE | 02 SITE NUMBER
NY 0000514380

II. ENFORCEMENT INFORMATION

01 PAST REGULATORY/ENFORCEMENT ACTION ☐ YES ☑ NO

02 DESCRIPTION OF FEDERAL, STATE, LOCAL REGULATORY/ENFORCEMENT ACTION

III. SOURCES OF INFORMATION (Cite specific references, e.g., state files, sample analysis, reports)

SECTION VI

PRELIMINARY REMEDIAL ALTERNATIVES AND COSTS

Remediation alternatives for the Nash Road site have not yet been evaluated due to presently unfinished chemical analyses. Once the presence and extent of groundwater surface water contamination is confirmed, several alternative remediation plans will be examined on the basis of their technical effectiveness and cost.

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APPENDIX A

FIELD PROCEDURES

APPENDIX A

FIELD PROCEDURES

Preliminary Emergency Surface Water Analysis

A preliminary round of surface water sampling was performed in June 1983 by Dames & Moore and Engineering Science. These sampling points are located on the eastern end of the site near the disposal trench and form a network surrounding the suspected "hot spots".

Engineering Science provided sample bottles and performed the chemical analyses. Samples were tested for the indicator. No preservatives were used.

Sampling Procedures

1. Sample bottles were labelled with routine identification information.

2. The sample bottle was unwrapped, opened, and submerged below the surface of the water.

3. As the bottle filled, all air bubbles were allowed to escape from inside the bottle to prevent volatization of chemicals.

4. The bottle was repackaged, placed in the cooler, and refrigerated. Chain of custody documents accompanied the cooler during transportation.

Magnetic Survey

The magnetic surveys at Nash Road were conducted utilizing a Geometrics Model 816/826A Magnetometer. The magnetometer indicated the magnetic field intensity, in gammas, of the earth at a single ground-surface point. The successful application of the magnetometer is determined by the magnetic intensity of the target and by the distance the target is buried below ground surface. For example, a large number of steel drums buried 10 to 20 feet deep would cause a relatively high magnetic value over background and would be easily detected with a magnetometer. On the other hand, only one drum buried 50 feet deep would cause a relatively low magnetic value over background and would not be easily detected with a magnetometer. The magnetometer will also detect areas where soil has been disturbed such as in a pit or trench. Once the natural magnetic field of the undisturbed soil has been altered by the excavation and/or burial of foreign material, the change in the magnetic field over the area can be detected by a magnetometer.

Electrical Resistivity Survey

The electrical resistivity survey consisted of both vertical and horizontal resistivity earth measurements. These measurements,

obtained with a Bison Earth Resistivity Model 2350B Meter, indicated the relative electrical resistance in ohms of the earth to the conductance of an induced electrical current through metal probes or electrodes pushed into the ground. As an example of the resistivity nature of the subsurface, a fresh-water uncontaminated aquifer would exhibit a relatively high resistivity, whereas a contaminated (with organics and/or metals) aquifer would exhibit a relatively low resistivity.

Vertical resistivity measurements, termed soundings, indicate the variation of resistivity at various depths at one ground-surface point. The resistivity sounding method applied at Nash Road was the "Modified Wenner Electrode Array". In this method the current electrodes (those furthest from the center of the array) are stationary while the potential electrodes (those closest to the center of the array) are moved away from the center at equally spaced distances. In the "Modified Wenner Electrode Array" the potential electrode distance closely approximates the depth of investigation into the subsurface. For example, a sounding with a total potential electrode distance of thirty feet would indicate resistivity values at approximately thirty feet below the ground surface.

Horizontal resistivity measurements, on the other hand, are termed profiles indicating the variation of resistivity at one approximmate depth at many ground-surface locations. The resistivity profile method applied at Nash Road was the standard Wenner Array (Bison, 1975). In this method the current and potential electrodes are pushed into the ground at equal distances from one another. The depth of investigation is a zone of the subsurface approximately three-fourths to one times the electrode spacing. For example, an electrode spacing of fifty feet in the Wenner Array would investigate a zone of the subsurface between approximately 38 to 50 feet deep. Five Wenner Arrays were utilized at the Nash Road site to distinguish shallow and deep subsurface variations in resistivity.

Air Quality Monitoring

Air quality monitoring for organic vapors with an HNU photoionization meter was implemented at each hole before, during, and after drilling. The purpose of air quality monitoring was three-fold: to determine whether the use of respirators was needed while on-site, to locate potential "hot-spots" from which vapors may emanate, and to support or disprove preliminary suspicions regarding the locations of the areas of high contamination. Additionally, an air quality survey was performed of the entire site. Several east-west traverses across the site were made while the meter was constantly operating. No contamination was detected.

Drilling

Drilling was performed by Parratt Wolff, Inc. with a CME-70 (truck-mounted) rig. A 3-1/2" I.D. hollow-stemmed continuous-

flight auger was used. All augers were steam-cleaned between borings to prevent cross-contamination during drilling. Two shallow borings were drilled to depths of 10 feet and 14 feet. Five borings were drilled to bedrock at depths of between 65 and 71 feet. Dense till was encountered at the deeper borings and, on occasion, a rotary bit and clean water were used to penetrate large cobbles.

Soil samples were taken by an open-drive split spoon sampler. Shallow borings were sampled continuously at 2-foot intervals. Deep borings were sampled continuously until the lacustrine clay was penetrated. Thereafter, the sampling method was standard sampling at 5-foot intervals. Glass sample jars were provided by the drilling subcontractor. Dames & Moore staff was responsible for drilling documentation at each boring.

Well Installation

Well installation took place immediately after drilling. Johnson stainless steel wire-wound continuous slot (10-slot size) screen was used for each well. The screen segments are 5-feet long and are flush-jointed; all joints are additionally secured with teflon tape. The two shallow wells have 5-foot long screens and the 5 deep wells have 10-foot long screens. All screens were cleaned by steaming or washing with hexane, methanol, and distilled water prior to installation.

Upon completing the screen and riser pipe emplacement, a No. 1 Q-rok sand filter was poured into the annulus to a height of two to four feet above the top of the screened interval. A 3-foot primary bentonite seal was set on top of the sand pack. When installing the shallow wells, a concrete backfill was poured on top of the bentonite seal to the the ground surface and a 6" O.D. steel protective casing with a locking cap was installed. After placing the primary bentonite seal in the deep wells, the auger was gradually withdrawn. The approximately 30-foot thick lacustrine clay was allowed to close-in and form a thick seal around the mid-section of the riser pipe. At the 4-foot depth, a supplementary bentonite seal was set to a depth of 2 feet. Concrete backfill was placed on top of the supplementary bentonite seal and a 6" O.D. steel protective casing with a locking cap was installed. Relative ground elevation was surveyed.

Well Development

Shallow wells were bailed until the discharge water was clear. Deep wells were developed by surging with clean water from the rig until the discharge water was clear. The deep wells were then bailed to remove excess water and to allow natural recovery of the well. The bailer was decontaminated between each well by washing with hexane and methanol, and rinsing with distilled water.

Groundwater Sampling

Groundwater samples were taken from each of the wells on-site and from one residential well off-site.

A MasterFlex pump and silicone hose were used to pump the two shallow wells. A Geofilter bladder pump with a teflon bladder and a silicone hose were used on the deep wells and on the residential well. The bladder pump was run by a 1 h.p. air compressor and a gasoline powered generator. All pumping and field testing equipment was decontaminated between wells with a wash of hexane and methanol and a rinse of distilled water. New silicone hose was used at each well and discarded after sampling.

Sample bottles and shipping coolers for samples from the on-site wells were provided by H2M Laboratories in Melville, N.Y. The sample bottles for the off-site, residential wells were provided by Compu-Chem Laboratories of Research Triangle Park, N.C.

On-Site Wells

Static water levels were measured prior to pumping in order to calculate the volume of water in each well. Two well volume exchanges were performed on each well before sampling. During sampling, care was taken to insure minimal aeration of the water occurred. Each bottle was tilted at approximately a 45 degree angle and the sample water was allowed to run slowly down the inside of the bottle to prevent the escape of volatile chemicals from the representative sample. Sample bottles for purgeable chemical analyses and those that contained preservatives were filled to the point where a meniscus would form, capped tightly, and inspected for air bubbles. Bottles in which air bubbles were found were reopened and water was added by droplets until this condition was corrected. Sample bottles for analyses of extractable chemicals were filled in the same manner, except that the fill line was at the bottom of the bottle neck.

After the sample bottles had been filled, they were wrapped in plastic protective sheets, placed in the shipping coolers, and refrigerated.The shipping packages provided by H2M were "Playmate" coolers by Igloo. Zip-loc bags filled with ice were used as the refrigerant and to provide extra cushioning protection during transportation. Chain of custody documents were included inside the shipping coolers, also sealed in separate plastic Zip-loc bags. Unique, tamper-proof "DAMES & MOORE" seals were placed on all of the coolers for quality assurance purposes. All packages were taken to an air courier for delivery to the laboratory with 24 hours of their sampling times.

Field tests performed during sampling were for specific conductance, temperature, and organic vapors. All field testing equipment was decontaminated between wells by washing with hexane and methanol and by rinsing with distilled water.

Off-Site Well Sampling

The off-site well that was sampled for chemical analysis is located at 7403 Nash Road, adjacent to the northwest corner of the landfill site. This property is owned by Mr. Osterman of North Tonawanda. The well on this property has a 6" casing diameter and is 75 feet deep. It is no longer in use.

Approximately one well volume exchanges was performed on Mr. Osterman's well. Precisely the same sampling methods were employed as those used at the on-site wells. However, a different laboratory was used for the chemical analysis of the off-site well, and the shipping procedure was slightly different. The Compu-Chem shipping package consisted of an insulated styrofoam container inside a corrugated paper box. "Blue-Ice" was used as the refrigerant in these packages, and the chain of custody document was taped to the top of the styrofoam container inside the box. A unique, tamper-proof "DAMES & MOORE" seal was placed on the package for quality assurance purposes. This package was taken to an air courier within two hours after the time of sampling.

In Situ Permeability Testing

After sampling each well, a recovery-type permeability test was performed. At the end of pumping, the water level in the well was low. A pressure transducer calibrated to record feet-of-head was lowered, linked to a microprocessing unit with printer, to the bottom of the well. Timed head readings were recorded for up to 30 minutes and permeabilities were calculated according to the formula (Lambe Whitman, 1969):

$$k_h = \frac{d^2 \ln(\frac{4mL}{D})}{8L\,(t_2 - t_1)} \ln(\frac{H_1}{H_2}) \text{ , cm/sec}$$

where: k_h = horizontal permeability
d = diameter of standpipe
m = transformation ratio
L = intake length
D = diameter of intake (borehole)
t = time
H = Head

At the end of each test, the pressure transducer was removed from the well.

Surface Water and Sediment Sampling

Surface water and sediment sampling bottles were provided by Compu-Chem Laboratories at Research Triangle Park, N.C. Surface water and sediment samples for chemical analysis were intended to be gathered at three designated locations at the west end of the

landfill site. Unfortunately, no surface water samples were collected since there was no available standing water during this sampling effort. However, sediment samples were successfully taken. The sampling procedure was to manually press a stainless steel 2-inch diameter tube into the dried sediment to a depth of 4 inches. Sediment sample was then extracted and placed in the sample jars. Sampling tube was decontaminated between sampling points by washing with hexane and methanol and by rinsing with distilled water. Photographs were taken of the three sediment sampling locations.

The sediment samples were packed in insulated styrofoam shipping packages and and refrigerated with "Blue-Ice." A chain of custody document was taped to the top of the styrofoam package and the entire parcel was encased in the corrugated paper box. Unique, tamper-proof "DAMES & MOORE" seals were placed on the packages for quality assurance purposes. All packages were taken to an air courier within 6 hours after their sampling times.

Down-Hole Gamma Logging

Each well was logged with a portable Mt. Soprus gamma logging unit. The procedure was to lower the probe to the bottom of the well and record gamma counts per second as the probe was slowly raised up the well to the ground surface. Typically, two runs per well were performed to check the precision of the unit and to allow for corrections to any portion of a record during which the paper or pen may have skipped or slid. After logging each well, the probe and cable was rinsed with distilled water.

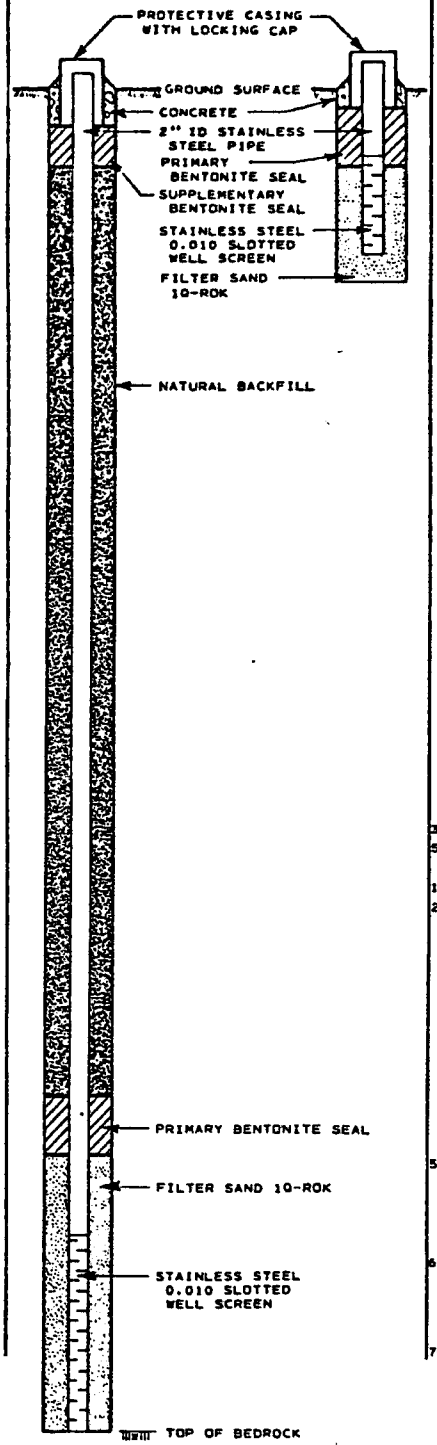
APPENDIX B

BORING LOGS AND WELL SCHEMATICS

BORING OW-1

WELL SCHEMATICS

OW-1B OW-1



SAMPLING					FRACTURES	DEPTH IN FEET	GRAPHIC LOG	DESCRIPTIVE GEOLOGIC NOTES
BLOW COUNT	SAMPLE NO. & TYPE	RUN NO.	CORE REC	CORE ROD				
								SURFACE CONDITIONS: GRASSY, WET.
5	1					0	ML	LIGHT BROWN MOIST MEDIUM SILT AND CLAY, TRACE OF SAND, OCCASIONAL BLACK ORGANIC STAINS
15	2							
15	3					5	CL	GRAY MOIST STIFF LAYERED CLAY AND SILT WITH OCCASIONAL SEAMS OF FINE TO MEDIUM SAND, 1/8" IN THICKNESS
35	4							GRADES TO LESS STIFF
15	5							
9	6					10		GRAY MOIST MEDIUM LAYERED CLAY, RED CLAY LAYERS APPROXIMATELY 1/10' THICKNESS AT IRREGULAR INTERVALS
10	7							
2	8							GRADES TO VERY SOFT CLAY
2	9					15		
	10							
	11					20		
9	1B:1					25	CH	GRADES TO SOFT
4	1B:2					30		GRADES TO VERY SOFT
						35		
38/6"	1B:3							BROWN, MOIST SILT AND COARSE TO FINE GRAVEL, LITTLE CLAY, LITTLE FINE SAND (TILL)
55/6"	1B:4					40		
16/6"	1B:5							GRADES TO WET
20/6"	1B:6							
						45		
98	1B:7					50	GM	GRADES TO MOIST, DENSE SILT, SOME FINE TO COARSE SAND, LITTLE FINE GRAVEL
55/6"	1B:8					55		
65/6"	1B:9					60		GRADES TO WET
76/6"	1B:10					65		

SOIL SAMPLING INFORMATION

- STANDARD PENETRATION TEST
- UNDISTURBED SAMPLE
- DISTURBED SAMPLE
- NO SAMPLE RECOVERED

ROCK CORE INFORMATION

- 80 — CORE LOSS ZONE
- PERCENT CORE RECOVERY
- 82 — CORE ROD

FRACTURES

- Zone of core loss
- Breccia zone
- Dip-slip slickensides
- Fractures-shown at approximate angle to core axis
- Mineralized fracture c - calcite s - sulfide
- Fractured zone
- Void

KEY TO WELL SCHEMATIC

- Grout
- Bentonite Seal
- Sand Filter
- Well Screen

DAMES & MOORE

FIGURE B-10

BORING OW-I

WELL SCHEMATICS	SAMPLING: BLOW COUNT	SAMPLING: SAMPLE NO & TYPE	SAMPLING: RUN NO	SAMPLING: CORE REC	SAMPLING: CORE ROD	FRACTURES	DEPTH IN FEET	GRAPHIC LOG	DESCRIPTIVE GEOLOGIC NOTES
							65	GM	TOP OF BEDROCK AT 68.6'. BEDROCK IS DOLOSTONE.
		18;11					70		BORING TERMINATED AT A DEPTH OF 68.6' ON JUNE 11, 1984.

PROJECT Dec. Nashua JOB NO. 13306-048 ISSUE DATE

DRAWING REV.	TITLE	C.I. SUPERVISION Initial - Date	R.I. Initial - Date	R.I.C. or R.M. Initial - Date	Q.A. Initial - Date
0	LS 7-85 FM				
1					
2					
3					

SOIL SAMPLING INFORMATION

- STANDARD PENETRATION TEST
- UNDISTURBED SAMPLE
- DISTURBED SAMPLE
- NO SAMPLE RECOVERED

ROCK CORE INFORMATION

- 80 — CORE LOSS ZONE; PERCENT CORE RECOVERY
- 82 — CORE ROD

FRACTURES

- Zone of core loss
- Breccia zone
- Dip-slip slickensides
- Fractures-shown at approximate angle to core axis
- Mineralized fracture c = calcite s = sulfide
- Fractured zone
- Void

KEY TO WELL SCHEMATIC

- Grout
- Bentonite Seal
- Sand Filter
- Well Screen

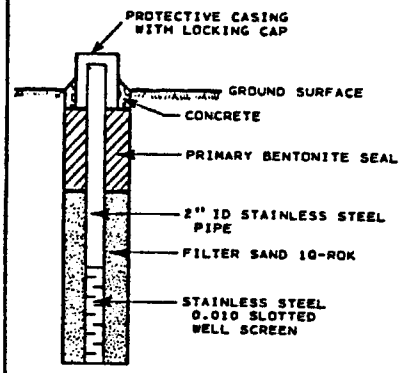
DAMES & MOORE

FIGURE B-19

BORING OW-2

WELL SCHEMATICS

OW-2



SAMPLING					FRACTURES	DEPTH IN FEET	GRAPHIC LOG
BLOW COUNT	SAMPLE NO & TYPE	RUN NO.	CORE REC	CORE ROD			
10	1 S					0	ML
11	2 S						
13	3 S						SW
34	4 S					5	
18	5 S						
5	6 S					10	CL
3	7 S						
						15	CH

DESCRIPTIVE GEOLOGIC NOTES

SURFACE CONDITIONS: GRASSY, MUDDY

LIGHT BROWN MOIST STIFF SILT, LITTLE FINE SAND

GRAY WET MEDIUM DENSE FINE SAND, TRACE SILT

GRAY AND BROWN MOIST STIFF LAYERED CLAY AND SILT; SILT LAYERS ABOUT 1/2" THICK

GRADES TO MEDIUM

GRADES TO SOFT

GRAY MOIST, VERY SOFT LAYERED CLAY; RED CLAY LAYERS ARE APPROXIMATELY 1/8" THICK AT 3/4" INTERVALS

BORING TERMINATED AT A DEPTH OF 14.0' ON JUNE 6, 1984.

PROJECT DEQ, Medford JOB NO. 13305-003

REV.	G.S. Initial - Date	G.S. Supervision Initial - Date	R.L. Initial - Date	R.I.C. or T.L. Initial - Date	Q.A. Initial - Date
0	6/6 7:30 PM				
1					
2					
3					

SOIL SAMPLING INFORMATION

- STANDARD PENETRATION TEST
- UNDISTURBED SAMPLE
- DISTURBED SAMPLE
- NO SAMPLE RECOVERED

ROCK CORE INFORMATION

- 80 — CORE LOSS ZONE; PERCENT CORE RECOVERY
- 82 — CORE ROD

FRACTURES

- Zone of core loss
- Breccia zone
- Dip-slip slickensides
- Fractures-shown at approximate angle to core axis
- Mineralized fracture c - calcite s - sulfide
- Fractured zone
- Void

KEY TO WELL SCHEMATIC

- Grout
- Bentonite Seal
- Sand Filter
- Well Screen

DAMES & MOORE

FIGURE B-2

BORING OW-3

SURFACE ELEVATION
COORDINATES

WELL SCHEMATICS

OW-3

SAMPLING					FRACTURES	DEPTH IN FEET	GRAPHIC LOG	DESCRIPTIVE GEOLOGIC NOTES
BLOW COUNT	SAMPLE NO & TYPE	RUN NO.	CORE REC.	CORE ROD				
								SURFACE CONDITIONS: GRASSY, TALL BRUSH
6	1					0		MIXED SAND/WASTE FILL
11	2							
7/.5"	3A							
9/.5"	3B							
32	4					5	CL	GRAY AND BROWN MOIST MEDIUM LAYERED CLAY AND SILT, TRACE FINE SAND, BROWN SILT LAYERS APPROXIMATELY 1/2" -1" IN THICKNESS AT 1 1/2" INTERVALS
20	5							GRADES TO STIFF AT 6.0'
7	6							GRAY MOIST MEDIUM LAYERED CLAY
6	7					10		RED CLAY LAYERS APPROXIMATELY 1/10" THICK AT 1/2" INTERVALS
4	8							GRADES TO SOFT WITH OCCASIONAL SILT LAYERS APPROXIMATELY 1/2" THICK AT 10.0'
2	9					15	CH	CLAY LAYERS BECOME LESS DISTINCT AT 12.0'
2	10							GRADES TO VERY SOFT AT 16.0'
2	11					20		
3	12A					25	CL	GRAY AND BROWN/RED MOIST MEDIUM STIFF LAYERED CLAY AND SILT AT 26.0'
3	12B							SEAM OF MOIST MEDIUM TO FINE SAND AT 26.3'
72/.5"	13							BROWN MOIST MEDIUM SILT AND COARSE TO FINE GRAVEL, TRACE FINE SAND, TRACE CLAY (TILL)
	14					30		GRADES TO DRY AND VERY STIFF SILT AT 28.5'
65/.5"	15							
100/.4"	16					35		GRADES TO MOIST AND HARD SILT
29	17					40		GRADES TO MOIST AND MEDIUM
21	18						GM	
23	19					45		GRADES TO WET
17	20					50		
75/.5"	21					55		
								GRADES TO COARSE TO FINE GRAVEL AND BROWN DRY HARD SILT, SOME WEATHERED ROCK FRAGMENTS, TRACE FINE SAND
96/.5"	22					60		
						65		

PROTECTIVE CASING WITH LOCKING CAP
GROUND SURFACE
CONCRETE
SUPPLEMENTARY BENTONITE SEAL
2" ID STAINLESS STEEL PIPE
NATURAL BACKFILL
PRIMARY BENTONITE SEAL
STAINLESS STEEL 0.010 SLOTTED WELL SCREEN
FILTER SAND 10-ROK
GRAVEL PACK
BENTONITE SEAL
GRAVEL PACK
TOP OF BEDROCK

SOIL SAMPLING INFORMATION

- STANDARD PENETRATION TEST
- UNDISTURBED SAMPLE
- DISTURBED SAMPLE
- NO SAMPLE RECOVERED

ROCK CORE INFORMATION

- 80 — CORE LOSS ZONE
- PERCENT CORE RECOVERY
- 82 — CORE ROD

2-01-80 PIEZOMETRIC SURFACE & DATE TESTED

FRACTURES

- Zone of core loss
- Breccia zone
- Dip-slip slickensides
- Fractures-shown at approximate angle to core axis
- Mineralized fracture c - calcite s - sulfide
- Fractured zone
- Void

KEY TO WELL SCHEMATIC

- Grout
- Bentonite Seal
- Sand Filter
- Well Screen

DAMES & MOORE

FIGURE B 3A

BORING OW-3

WELL SCHEMATICS	SAMPLING: BLOW COUNT	SAMPLING: SAMPLE NO & TYPE	SAMPLING: RUN NO	SAMPLING: CORE REC.	SAMPLING: CORE ROD	FRACTURES	DEPTH IN FEET	GRAPHIC LOG	DESCRIPTIVE GEOLOGIC NOTES
							65	GM	TOP OF BEDROCK 68.7' BEDROCK IS DOLOSTONE BORING TERMINATED AT A DEPTH OF 68.7' ON JUNE 7, 1984.
							70		

PROJECT DEC, Nashua JOB NO. 13305-003

REV.	DRAWING TITLE	T.L. BORING - Date	T.L. SUPERVISION Initial - Date	T.L. Initial - Date	T.L. or T.M. Initial - Date	Q.A. Initial - Date
0		ES 6/11/84				
1						
2						
3						

SOIL SAMPLING INFORMATION

- STANDARD PENETRATION TEST
- UNDISTURBED SAMPLE
- DISTURBED SAMPLE
- NO SAMPLE RECOVERED

ROCK CORE INFORMATION

- 80 — CORE LOSS ZONE; PERCENT CORE RECOVERY
- 82 — CORE ROD

FRACTURES

- Zone of core loss
- Breccia zone
- Dip-slip slickensides
- Fractures-shown at approximate angle to core axis
- Mineralized fracture c = calcite s = sulfide
- Fractured zone
- Void

KEY TO WELL SCHEMATIC

- Grout
- Bentonite Seal
- Sand Filter
- Well Screen

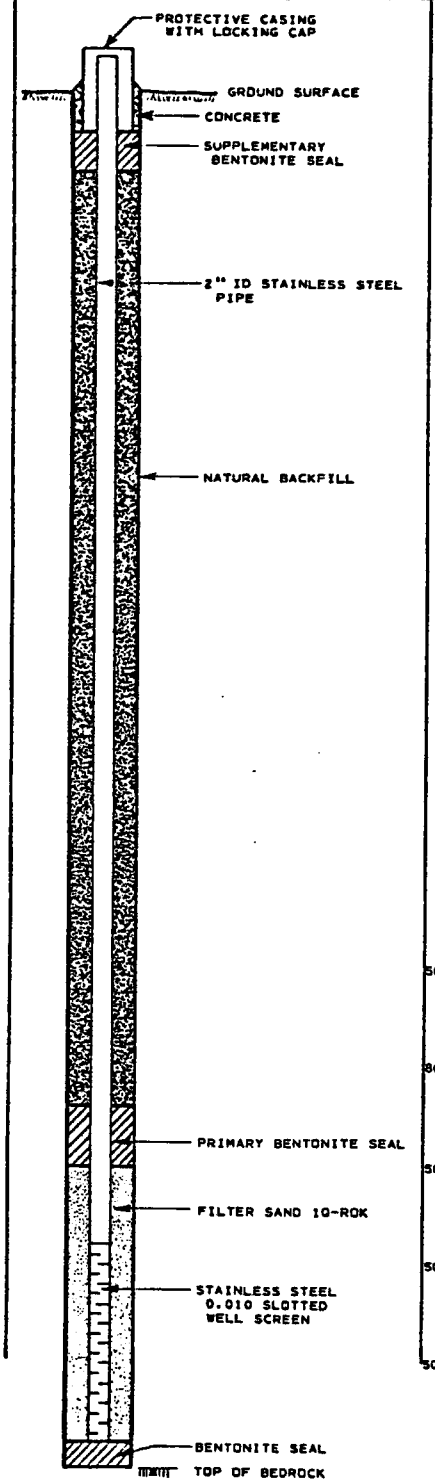
DAMES & MOORE

FIGURE B-28

BORING OW-4

WELL SCHEMATICS

OW-4



BLOW COUNT	SAMPLE NO & TYPE	RUN NO.	CORE REC	CORE ROD	FRACTURES
22	1				
15	2				
17	3				
33	4				
10	5				
18	6				
16					
8	7				
6	8				
5	9				
2	10				
3					
2	11				
2					
2	12				
2					
2	13				
2					
2	14				
2					
26	15				
46	16				
50/.2'	17				
	18				
50/.5'	19				
50/.5'	20				
50/.4'	21				
50/.5'	22				

DEPTH IN FEET: 0, 5, 10, 15, 20, 25, 30, 35, 40, 45, 50, 55, 60, 65

GRAPHIC LOG: ML, SW, CL, CH, SW, SP, GM

DESCRIPTIVE GEOLOGIC NOTES

SURFACE CONDITIONS: GRASSY, SOME SURFACE TRASH

MIXED SAND/WASTE FILL

GRAY MOIST SILT AND CLAY

GRAY WET MEDIUM TO FINE SAND, TRACE SILT, ORGANIC ODOR, SOME BLACK STAIN

GRAY AND BROWN MOIST LAYERED SILT AND CLAY, TRACE FINE SAND

LAYERS APPROX. 1/2" THICK

GRADES TO WET BROWN SILT AND CLAY

GRADES TO CLAY, TRACE SILT

BROWN WET SILT AND FINE TO COARSE SAND, LITTLE MEDIUM TO FINE GRAVEL

BROWN WET MEDIUM TO FINE SAND

BROWN MOIST SILT, AND COARSE TO FINE SAND, LITTLE FINE TO COARSE SAND (TILL)

GRADES TO WET

GRADES TO MOIST

SOIL SAMPLING INFORMATION

- STANDARD PENETRATION TEST
- UNDISTURBED SAMPLE
- DISTURBED SAMPLE
- NO SAMPLE RECOVERED

KEY TO WELL SCHEMATIC

- Grout
- Bentonite Seal
- Sand Filter
- Well Screen

DAMES & MOORE

FIGURE B.4A

BORING OW-4

WELL SCHEMATICS	SAMPLING: BLOW COUNT	SAMPLE NO & TYPE	RUN NO.	CORE REC	CORE ROD	FRACTURES	DEPTH IN FEET	GRAPHIC LOG	DESCRIPTIVE GEOLOGIC NOTES
							65	GM	TOP OF BEDROCK 70.3' BEDROCK IS DOLOSTONE
							70		BORING TERMINATED AT A DEPTH OF 70.3' ON JUNE 13, 1984.

PROJECT Arco Fuel - Black Rd. JOB NO. 1330-004-01 BORE DATE

REV.	R.E. (Initial - Date)	R.E. SUPERVISOR (Initial - Date)	R.E. (Initial - Date)	R.E. of R.E. (Initial - Date)	Q.A. (Initial - Date)
0	DT 6/18/84	DT 6/18/84			
1					
2					
3					

SOIL SAMPLING INFORMATION

- STANDARD PENETRATION TEST
- UNDISTURBED SAMPLE
- DISTURBED SAMPLE
- NO SAMPLE RECOVERED

ROCK CORE INFORMATION

80 — CORE LOSS ZONE

PERCENT CORE RECOVERY

82 — CORE ROD

FRACTURES

- Zone of core loss
- Breccia zone
- Dip-slip slickensides
- Fractures-shown at approximate angle to core axis
- Mineralized fracture c = calcite s = sulfide
- Fractured zone
- Void

KEY TO WELL SCHEMATIC

- Grout
- Bentonite Seal
- Sand Filter
- Well Screen

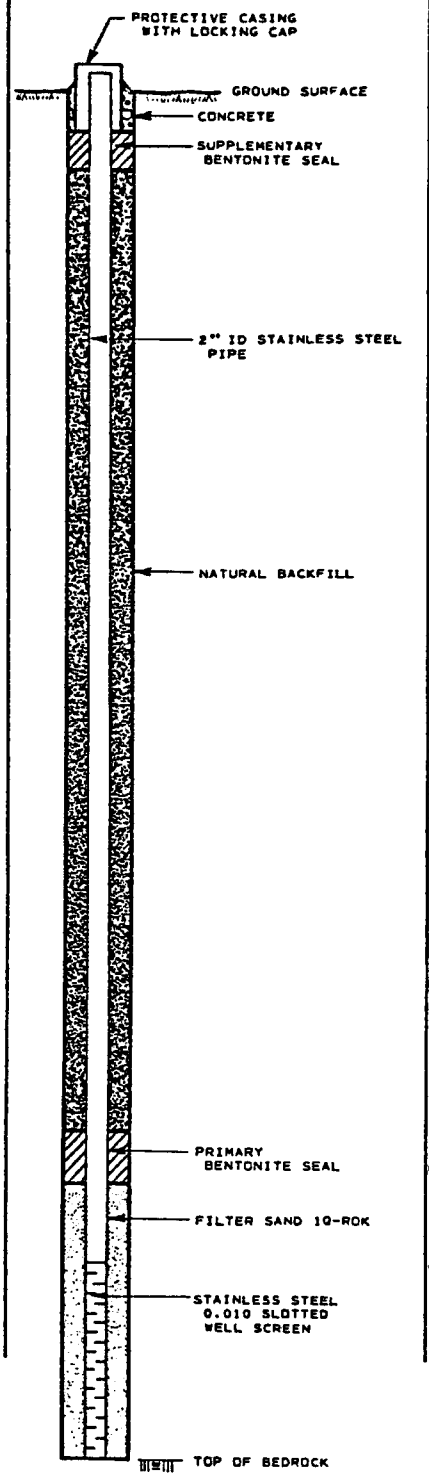
DAMES & MOORE

FIGURE B.4B

BORING OW-5

WELL SCHEMATICS

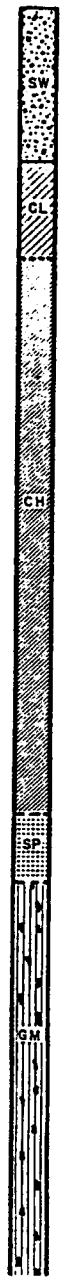
OW-5



BLOW COUNT	SAMPLE NO & TYPE	RUN NO.	CORE REC	CORE ROD	FRACTURES	DEPTH IN FEET
17	1 S					0
11/6"	2 S					5
9/6"	3 S					
12	4					
29	5 S					10
5	6 S					
6	7 S					15
2	8 S					20
2	9 S					25
2	10 S					30
2	11 S					35
2	12 S					40
39/5"	13 S					45
50/4"	14 S					
50/2"	15 S					50
60/4"	16 S					55
65/5"	17 S					60
	18 S					65

SAMPLING

GRAPHIC LOG



DESCRIPTIVE GEOLOGIC NOTES

SURFACE CONDITIONS: GRASSY, ATOP FILL

GRAY, WET MEDIUM TO FINE SAND, TRACE SILT

GRADES TO FINE SAND

GRAY AND BROWN MOIST LAYERED CLAY AND SILT, TRACE FINE SAND

SILT LAYERS APPROXIMATELY 1/2" THICK, OCCASIONAL SEAMS OF WET FINE TO MEDIUM SAND APPROXIMATELY 1/8" THICKNESS

GRAY WET SOFT LAYERED CLAY

RED CLAY LAYERS APPROXIMATELY 1/10" THICKNESS AT IRREGULAR INTERVALS

GRADES TO VERY SOFT

RED CLAY LAYERS APPROXIMATELY 1/10" THICKNESS AT 3/4" INTERVALS

BROWN WET LAYERED SILT AND COARSE TO FINE SAND

BROWN WET SILT AND FINE TO COARSE GRAVEL, SOME COARSE TO FINE SAND, TRACE CLAY (TILL)

GRADES TO MOIST

GRADES TO MORE GRAVEL, LESS SILT, DRY

GRADES TO WET SILT, SOME MEDIUM TO FINE GRAVEL, LITTLE WEATHERED BEDROCK FRAGMENTS AT 65.0'

SOIL SAMPLING INFORMATION

- ⊠ STANDARD PENETRATION TEST
- ■ UNDISTURBED SAMPLE
- ⊠ DISTURBED SAMPLE
- □ NO SAMPLE RECOVERED

KEY TO WELL SCHEMATIC

- Grout
- Bentonite Seal
- Sand Filter
- Well Screen

DAMES & MOORE

FIGURE B-5A

BORING OW-5

WELL SCHEMATICS	SAMPLING: BLOW COUNT	SAMPLE NO & TYPE	RUN NO	CORE REC.	CORE ROD	FRACTURES	DEPTH IN FEET	GRAPHIC LOG	DESCRIPTIVE GEOLOGIC NOTES
							65	GM	TOP OF DOLOSTONE BEDROCK AT 69.8'
							70		BORING TERMINATED AT A DEPTH OF 70.0' ON JUNE 14, 1984.

PROJECT _____ JOB NO. _____ ISSUE DATE _____

DRAWING TITLE	REV.	E.I. Initial - Date	E.I. SUPERVISOR Initial - Date	R.I. Initial - Date	R.I.C. or R.E. Initial - Date	Q.A. Initial - Date
	0					
	1					
	2					
	3					

SOIL SAMPLING INFORMATION

- STANDARD PENETRATION TEST
- UNDISTURBED SAMPLE
- DISTURBED SAMPLE
- NO SAMPLE RECOVERED

ROCK CORE INFORMATION

80 — CORE LOSS ZONE
PERCENT CORE RECOVERY

82 — CORE ROD

FRACTURES

- Zone of core loss
- Breccia zone
- Dip-slip slickensides
- Fractures-shown at approximate angle to core axis
- Mineralized fracture c - calcite s - sulfide
- Fractured zone
- Void

KEY TO WELL SCHEMATIC

- Grout
- Bentonite Seal
- Sand Filter
- Well Screen

DAMES & MOORE

FIGURE B.5B

BORING OW-6

WELL SCHEMATICS

OW-6

PROTECTIVE CASING WITH LOCKING CAP
GROUND SURFACE
CONCRETE
SUPPLEMENTARY BENTONITE SEAL
2" ID STAINLESS STEEL PIPE
NATURAL BACKFILL
PRIMARY BENTONITE SEAL
FILTER SAND 10-ROK
STAINLESS STEEL 0.010 SLOTTED WELL SCREEN
TOP OF BEDROCK

SAMPLING					FRACTURES	DEPTH IN FEET	GRAPHIC LOG	DESCRIPTIVE GEOLOGIC NOTES
BLOW COUNT	SAMPLE NO & TYPE	RUN NO	CORE REC	CORE ROD				
						0		SURFACE CONDITIONS: VERY MUDDY WITH STANDING WATER; MARSHY GRASS
								MIXED SAND/WASTE FILL
12	1 S					5	SW	GRAY WET MEDIUM TO FINE SAND, LITTLE SILT, SOME BLACK STAINS
31	2 S							
17	3 S						CL	GRAY AND BROWN MOIST STIFF LAYERED CLAY AND SILT, SILT LAYERS APPROXIMATELY 1/4" THICK AT 1" INTERVALS
41	4 S					10		GRAY MOIST STIFF CLAY
15	5 S							GRADES TO MEDIUM CLAY AT 13.0'
4	6 S					15		GRADES TO SOFT AT 15.0'
2	7 S					20		GRAY WET SOFT LAYERED CLAY
								RED CLAY LAYERS APPROXIMATELY 1/2" THICK AT 1 1/2 TO 2" INTERVALS (DETECTABLE ORGANIC ODOR)
2	8 S					25	CH	
2	9 S					30		
2	10 S					35		RED CLAY LAYERS APPROXIMATELY 2" THICK AT 1" INTERVALS AT 35.0'
								TRACE SMALL BLACK MOTTLES OF ORGANIC MATERIAL IN RED LAYERS
2	11 S					40		
39	12 S					45	GM	BROWN DRY MEDIUM SILT, AND MEDIUM TO FINE GRAVEL, TRACE CLAY, TRACE FINE TO COARSE SAND (TILL)
39	13 S					50		GRADES TO MOIST
61/5"	14 S					55		GRADES TO WET, MORE GRAVEL, LESS SILT
55/5"	15 S					60		
						65		

SOIL SAMPLING INFORMATION

- S STANDARD PENETRATION TEST
- ■ UNDISTURBED SAMPLE
- ▣ DISTURBED SAMPLE
- □ NO SAMPLE RECOVERED

ROCK CORE INFORMATION

80 — CORE LOSS ZONE
PERCENT CORE RECOVERY
82 — CORE ROD

FRACTURES

- Zone of core loss
- Breccia zone
- Dip-slip slickensides
- Fractures-shown at approximate angle to core axis
- Mineralized fracture c - calcite s - sulfide
- Fractured zone
- Void

KEY TO WELL SCHEMATIC

- Grout
- Bentonite Seal
- Sand Filter
- Well Screen

DAMES & MOORE

FIGURE B.6A

BORING OW-6

WELL SCHEMATICS	SAMPLING: BLOW COUNT	SAMPLE NO & TYPE	RUN NO	CORE REC	CORE ROD	FRACTURES	DEPTH IN FEET	GRAPHIC LOG	DESCRIPTIVE GEOLOGIC NOTES
							65	PGM	TOP OF BEDROCK 66.0' BEDROCK IS DOLOSTONE
							70		BORING TERMINATED AT A DEPTH OF 66.0' ON JUNE 19, 1984.

PROJECT Oleg Alaska JOB NO. 13305-003 ISSUE DATE

DRAWING TITLE	T.L. Initial + Date	T.L. SUPERVISOR Initial + Date	R.L. Initial + Date	R.I.C. or R.E. Initial + Date	Q.A. Initial + Date
REV. 0	8/7-26-84				
1					
2					
3					

SOIL SAMPLING INFORMATION

- STANDARD PENETRATION TEST
- UNDISTURBED SAMPLE
- DISTURBED SAMPLE
- NO SAMPLE RECOVERED

ROCK CORE INFORMATION

80 — CORE LOSS ZONE

PERCENT CORE RECOVERY

82 — CORE ROD

FRACTURES

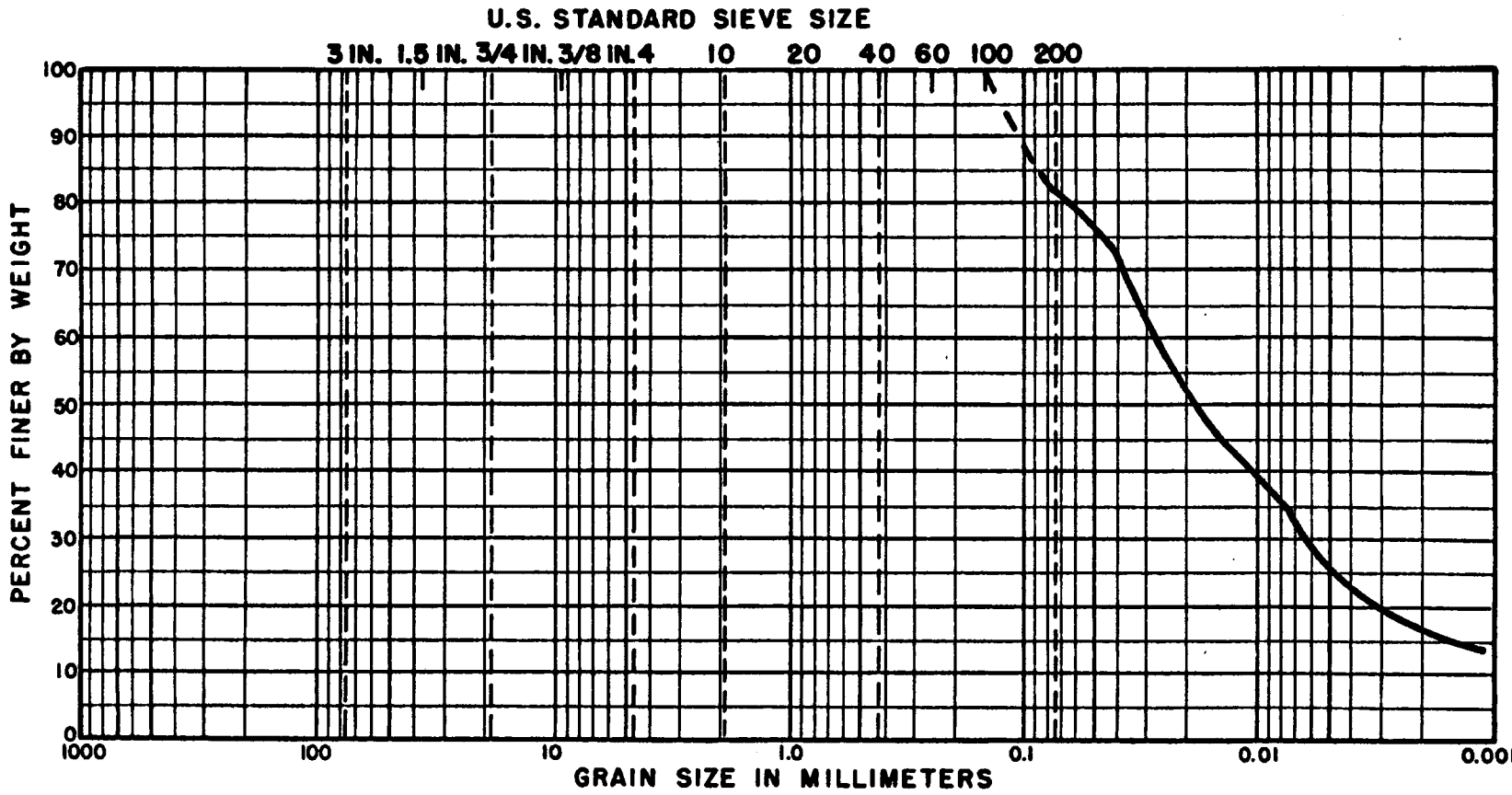
- Zone of core loss
- Breccia zone
- Dip-slip slickensides
- Fractures-shown at approximate angle to core axis
- Mineralized fracture c - calcite s - sulfide
- Fractured zone
- Void

KEY TO WELL SCHEMATIC

- Grout
- Bentonite Seal
- Sand Filter
- Well Screen

DAMES & MOORE

FIGURE B.6B



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

BORING	DEPTH	CLASSIFICATION		NAT. WC	LL	PL	PI	
OW-1	2.0' - 4.0'	ML	YELLOW SILT	15.2%				

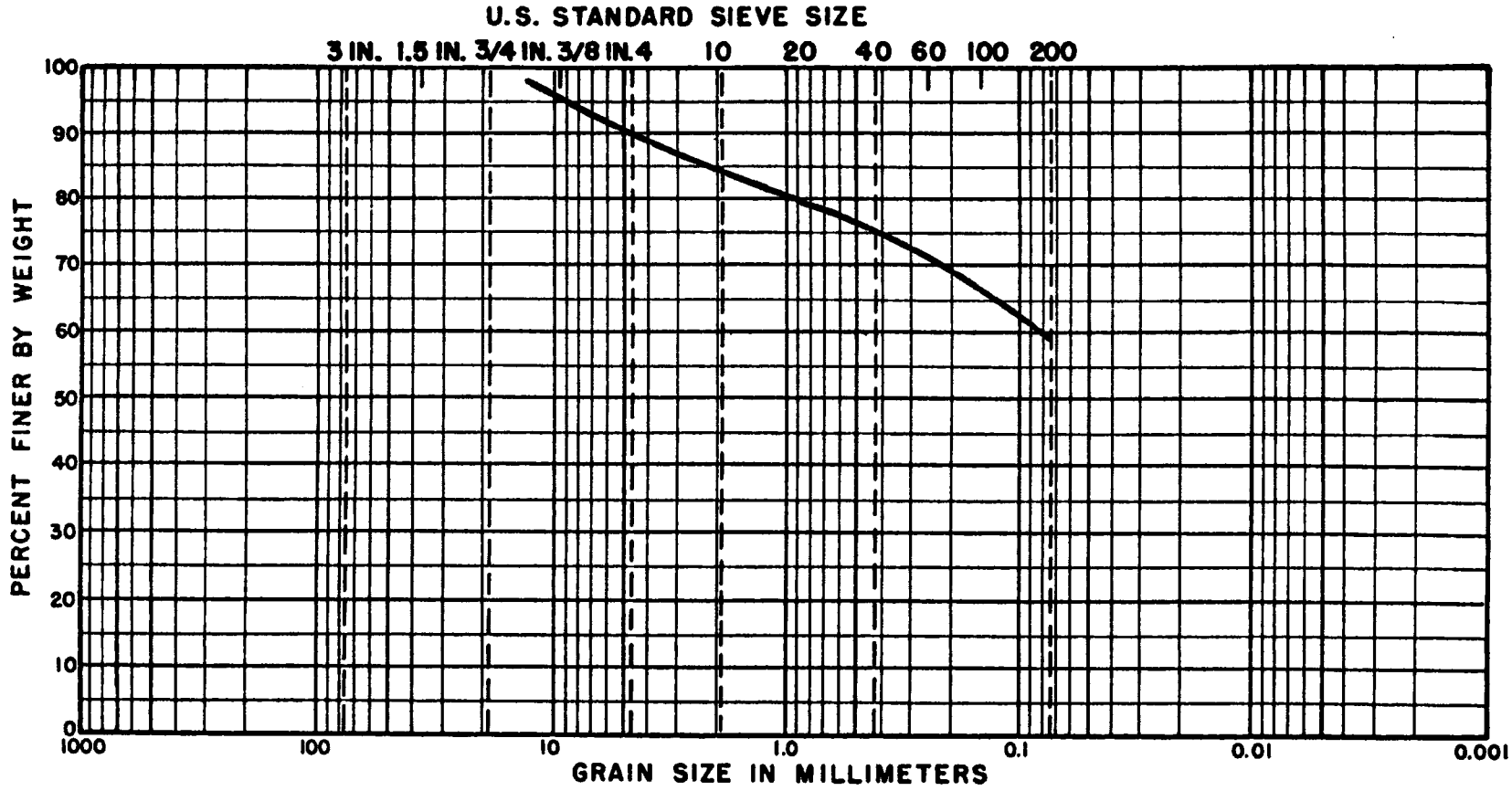
Note: Black sand sized particles and froth on top of solution in hydrometer; soapy odor

Color: Yellow

GRADATION CURVE

DAMES & MOORE

FIGURE B.7



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

BORING	DEPTH	CLASSIFICATION		NAT. WC	LL	PL	PI	
OW1-B	50.0 - 51.5'	GM	PINKISH BROWN TILL					

DAMES & MOORE

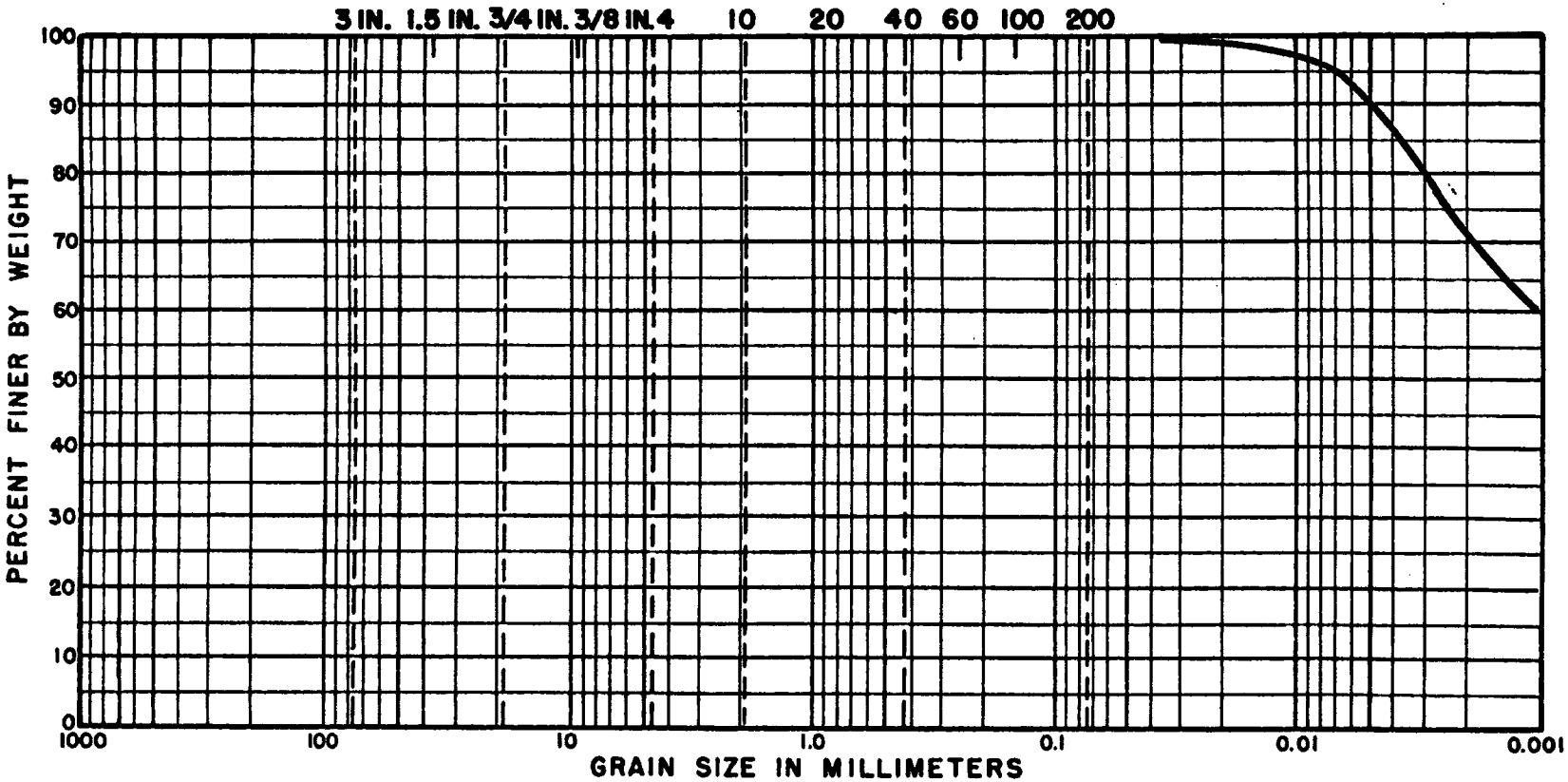
FIGURE B.8

GRADATION CURVE

FILE
BY DATE
CHECKED BY DATE

REVISIONS
BY DATE
BY DATE
PLATE OF

U.S. STANDARD SIEVE SIZE



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

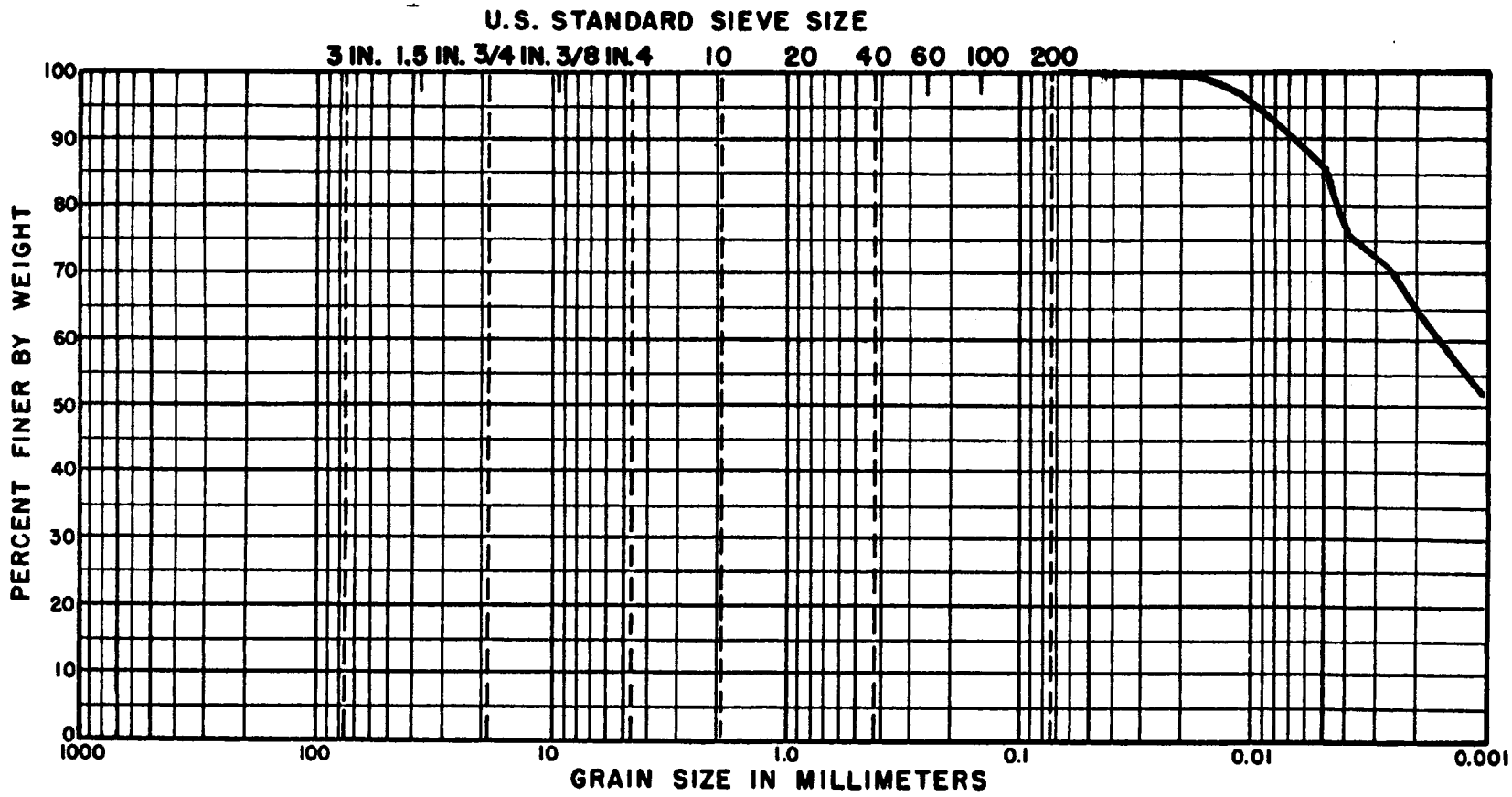
BORING	DEPTH	CLASSIFICATION		NAT. WC	LL	PL	PI	
OW-4	12.0' - 13.0'	CL	GRAY BROWN LACUSTRINE CLAY	33.2%				

COLOR: GRAY - BROWN

GRADATION CURVE

DAMES & MOORE

FIGURE B.9



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

BORING	DEPTH	CLASSIFICATION		NAT. WC	LL	PL	PI	
OW-4	30.0' - 32.0'	CLT	BROWN LACUSTRINE CLAY	36.5%				

NOTE: Small bubbles throughout solution in hydrometer

COLOR: Light brown

GRADATION CURVE

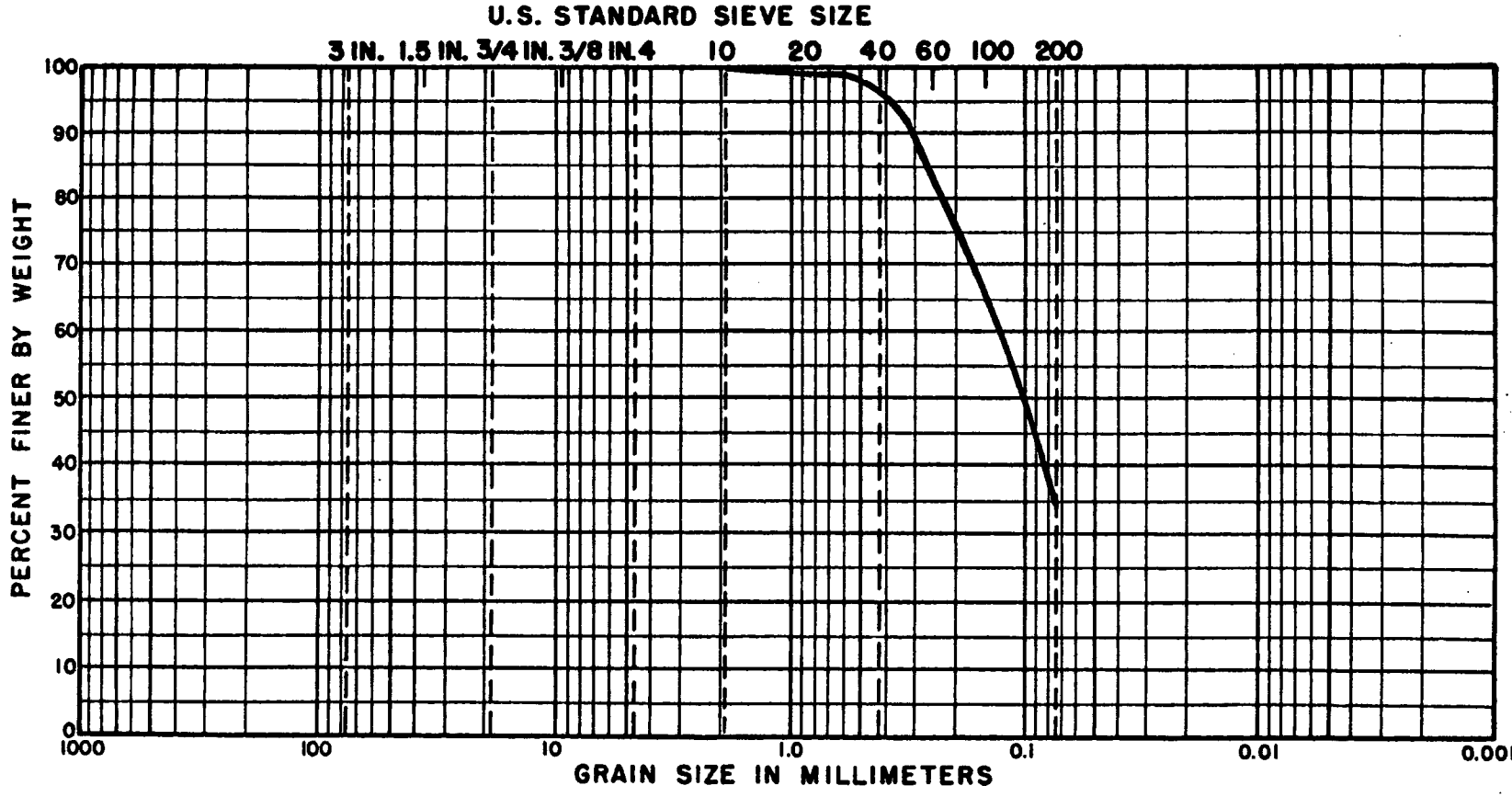
DAMES & MOORE

FIGURE B.10

FILE 1305-003-19
BY D. Dames DATE 8/10/84
CHECKED BY _____ DATE _____

REVISIONS
BY _____ DATE _____
BY _____ DATE _____
PLATE _____ OF _____

757.2 (REV. 4-82)



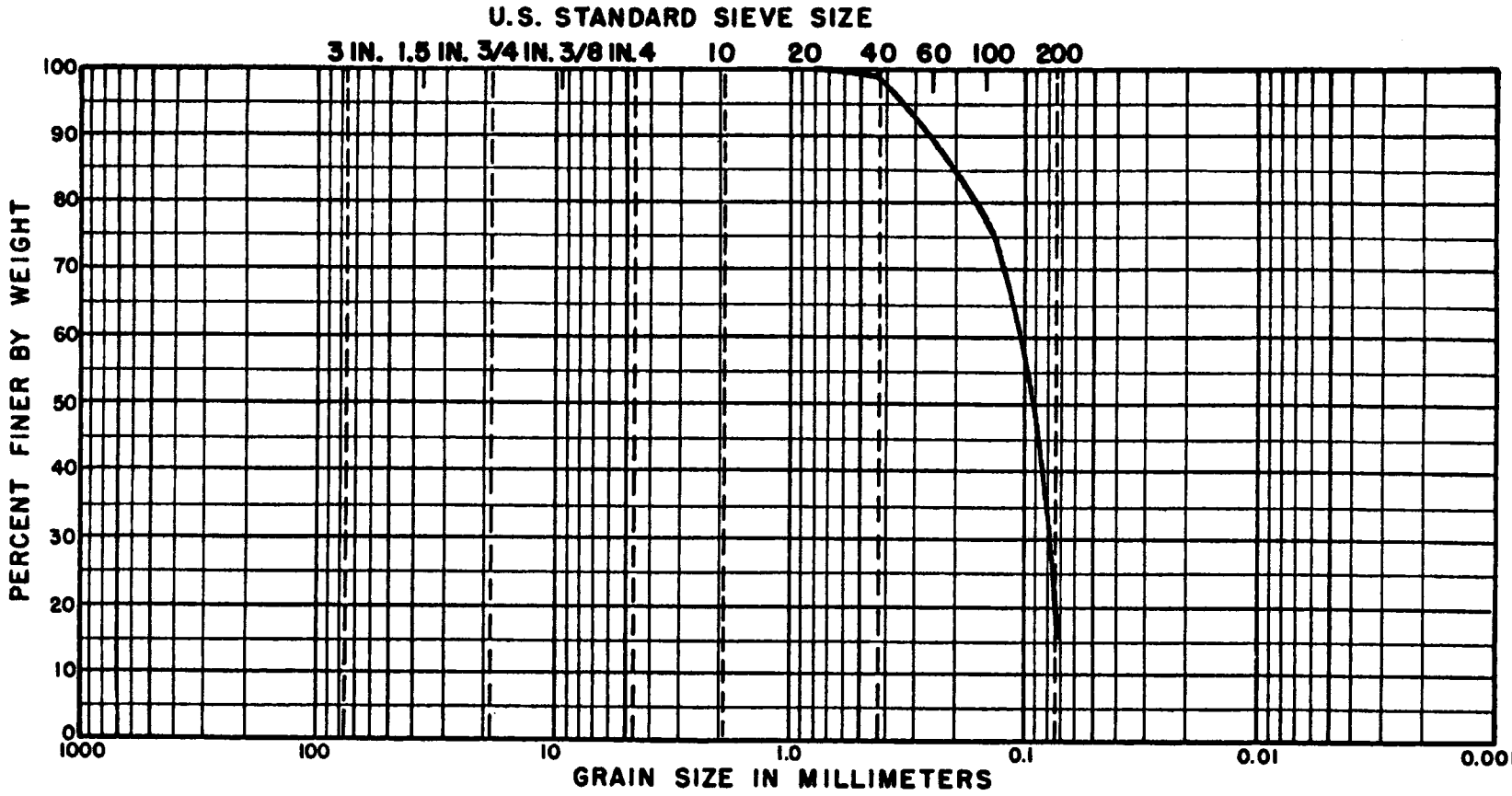
COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

BORING	DEPTH	CLASSIFICATION		NAT. WC	LL	PL	PI	
OW-4	44.6 - 45.0'	SP	LOWER SAND UNIT					

DAMES & MOORE

FIGURE B.11

GRADATION CURVE



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

BORING	DEPTH	CLASSIFICATION		NAT. WC	LL	PL	PI	
OW-5	5.0 - 7.0'	SW	UPPER SAND UNIT					

GRADATION CURVE

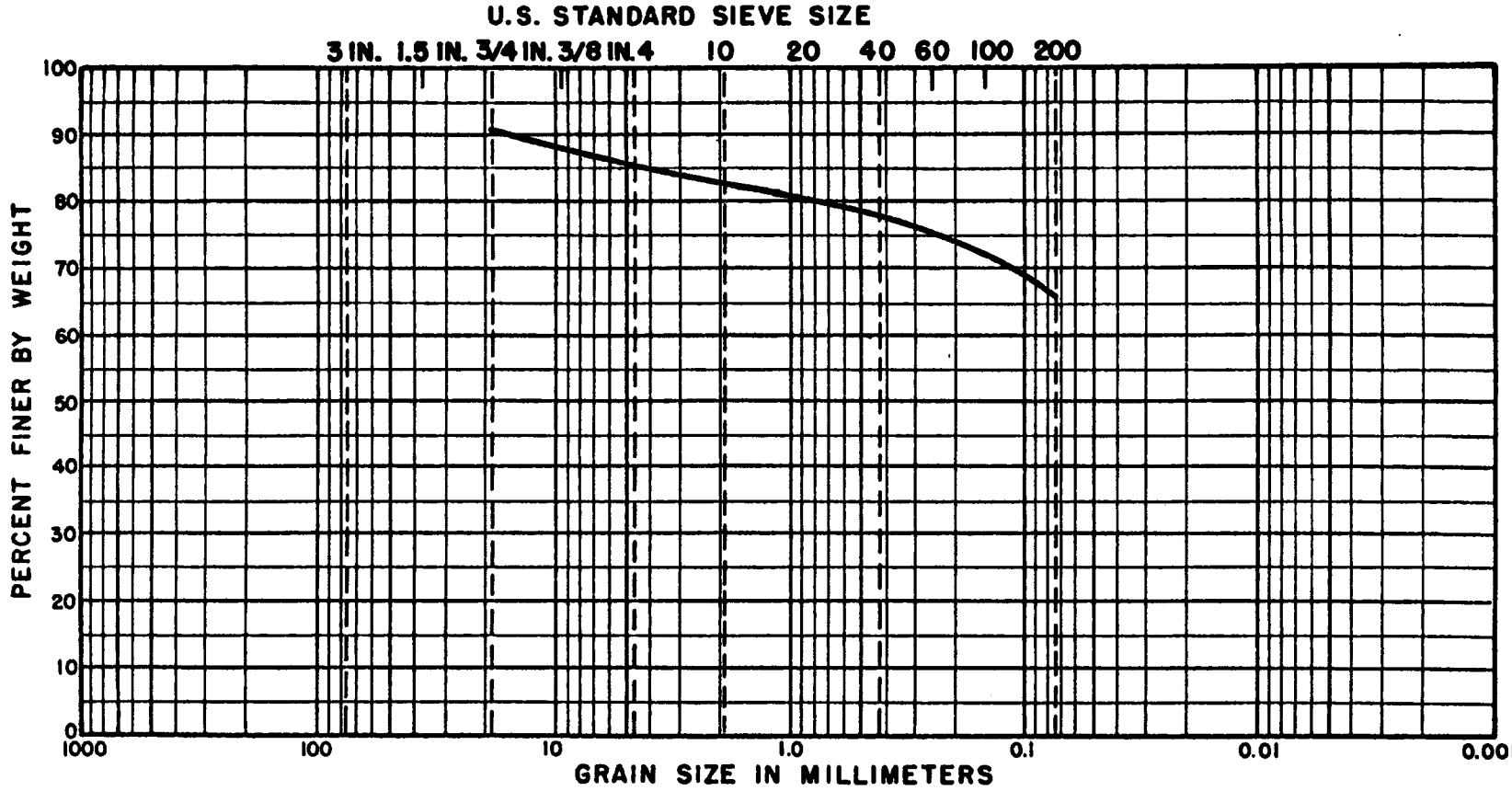
DAMES & MOORE

FIGURE B.12

FILE 13305.003-19
BY D. Danca DATE 8/10/84
CHECKED BY _____ DATE _____

REVISIONS
BY _____ DATE _____
BY _____ DATE _____
PLATE _____ OF _____

757.2 (REV. 4-62)



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

BORING	DEPTH	CLASSIFICATION		NAT. WC	LL	PL	PI	
OW-6	60.0 - 60.5'	GM	PINKISH BROWN TILL					

DAMES & MOORE

FIGURE B.13

GRADATION CURVE

APPENDIX C

GEOPHYSICAL SURVEY DATA

SOUNDING 1 NASH ROAD LANDFILL

p-p1 spacing (feet)	dial reading (ohms)	scale multiplier	corrected reading (ohms)	*k (feet)	apparent resistivity (ohm-ft)	cumulative resistivity (ohm-ft)
2.00	8.50	0.10	0.85	2499.80	2124.83	2124.83
4.00	19.50	0.10	1.95	1249.50	2436.53	4561.36
6.00	250.50	0.01	2.51	832.60	2085.66	6647.02
8.00	30.50	0.01	0.31	624.00	190.32	6837.34
10.00	40.50	0.01	0.41	498.80	202.01	7039.35
12.00	484.00	0.01	4.84	415.20	2009.57	9048.92
14.00	30.00	0.10	3.00	355.40	1066.20	10115.12
16.00	661.00	0.10	66.10	310.50	20524.05	30639.17
18.00	752.00	0.10	75.20	275.50	20717.60	51356.77
20.00	820.50	0.10	82.05	247.50	20307.38	71664.15
22.00	888.00	0.10	88.80	224.50	19935.60	91599.75
24.00	90.50	0.10	9.05	205.30	1857.97	93457.71
26.00	102.00	0.10	10.20	189.10	1928.82	95386.53
28.00	118.00	0.10	11.80	175.10	2066.18	97452.71
30.00	106.50	0.10	10.65	162.90	1734.89	99187.60
32.00	131.00	0.10	13.10	152.30	1995.13	101182.73
34.00	142.50	0.10	14.25	142.80	2034.90	103217.63
36.00	155.00	0.10	15.50	134.40	2083.20	105300.83
38.00	163.50	0.10	16.35	126.80	2073.18	107374.01
40.00	170.00	0.10	17.00	120.00	2040.00	109414.01
42.00	179.00	0.10	17.90	113.80	2037.02	111451.03
44.00	194.00	0.10	19.40	108.10	2097.14	113548.17
46.00	198.00	0.10	19.80	102.90	2037.42	115585.59
48.00	209.50	0.10	20.95	98.20	2057.29	117642.88
50.00	197.50	0.10	19.75	93.80	1852.55	119495.43
52.00	224.00	0.10	22.40	89.70	2009.28	121504.71
54.00	233.50	0.10	23.35	85.80	2003.43	123508.14
56.00	246.00	0.10	24.60	82.30	2024.58	125532.72
58.00	255.50	0.10	25.55	79.00	2018.45	127551.17
60.00	268.00	0.10	26.80	75.80	2031.44	129582.61
62.00	274.00	0.10	27.40	72.90	1997.46	131580.07
64.00	286.00	0.10	28.60	70.10	2004.86	133584.93
66.00	296.50	0.10	29.65	67.50	2001.38	135586.30
68.00	309.00	0.10	30.90	65.00	2008.50	137594.80
70.00	320.00	0.10	32.00	62.70	2006.40	139601.20
72.00	330.00	0.10	33.00	60.40	1993.20	141594.40
74.00	339.00	0.10	33.90	58.30	1976.37	143570.77
76.00	348.50	0.10	34.85	56.30	1962.06	145532.83
78.00	361.00	0.10	36.10	54.40	1963.84	147496.66
80.00	373.00	0.10	37.30	52.50	1958.25	149454.91
82.00	385.00	0.10	38.50	50.70	1951.95	151406.87
84.00	395.00	0.10	39.50	49.00	1935.50	153342.37
86.00	401.00	0.10	40.10	47.40	1900.74	155243.11
88.00	408.00	0.10	40.80	45.80	1868.64	157111.75
90.00	419.00	0.10	41.90	44.30	1856.17	158967.92
92.00	435.00	0.10	43.50	42.80	1861.80	160829.72
94.00	452.00	0.10	45.20	41.40	1871.28	162701.00
96.00	471.50	0.10	47.15	40.10	1890.72	164591.71
98.00	480.00	0.10	48.00	38.80	1862.40	166454.11
100.00	490.00	0.10	49.00	37.50	1837.50	168291.61

SOUNDING 2 NASH ROAD LANDFILL

p-p1 spacing (feet)	dial reading (ohms)	scale multiplier	corrected reading (ohms)	*k (feet)	apparent resistivity (ohm-ft)	cumulative resistivity (ohm-ft)
2.00	2.50	0.10	0.25	2499.80	624.95	624.95
4.00	1.50	0.10	0.15	1249.50	187.43	812.38
6.00	2.00	0.10	0.20	832.60	166.52	978.90
8.00	4.00	0.10	0.40	624.00	249.60	1228.50
10.00	5.00	0.10	0.50	498.80	249.40	1477.90
12.00	6.00	0.10	0.60	415.20	249.12	1727.02
14.00	6.50	0.10	0.65	355.40	231.01	1958.03
16.00	8.00	0.10	0.80	310.50	248.40	2206.43
18.00	3.00	0.10	0.30	275.50	82.65	2289.08
20.00	5.00	0.10	0.50	247.50	123.75	2412.83
22.00	8.50	0.10	0.85	224.50	190.83	2603.65
24.00	10.50	0.10	1.05	205.30	215.57	2819.22
26.00	12.00	0.10	1.20	189.10	226.92	3046.14
28.00	12.00	0.10	1.20	175.10	210.12	3256.26
30.00	12.50	0.10	1.25	162.90	203.63	3459.88
32.00	13.50	0.10	1.35	152.30	205.61	3665.49
34.00	14.50	0.10	1.45	142.80	207.06	3872.55
36.00	16.50	0.10	1.65	134.40	221.76	4094.31
38.00	15.00	0.10	1.50	126.80	190.20	4284.51
40.00	16.50	0.10	1.65	120.00	198.00	4482.51
42.00	17.00	0.10	1.70	113.80	193.46	4675.97
44.00	17.50	0.10	1.75	108.10	189.18	4865.14
46.00	18.50	0.10	1.85	102.90	190.37	5055.51
48.00	20.00	0.10	2.00	98.20	196.40	5251.91
50.00	20.50	0.10	2.05	93.80	192.29	5444.20
52.00	20.50	0.10	2.05	89.70	183.89	5628.08
54.00	22.50	0.10	2.25	85.80	193.05	5821.13
56.00	23.50	0.10	2.35	82.30	193.41	6014.54
58.00	24.50	0.10	2.45	79.00	193.55	6208.09
60.00	25.50	0.10	2.55	75.80	193.29	6401.38
62.00	25.00	0.10	2.50	72.90	182.25	6583.63
64.00	25.50	0.10	2.55	70.10	178.76	6762.38
66.00	27.50	0.10	2.75	67.50	185.63	6948.01
68.00	28.50	0.10	2.85	65.00	185.25	7133.26
70.00	27.50	0.10	2.75	62.70	172.43	7305.68
72.00	30.50	0.10	3.05	60.40	184.22	7489.90
74.00	32.50	0.10	3.25	58.30	189.48	7679.38
76.00	33.00	0.10	3.30	56.30	185.79	7865.17
78.00	35.00	0.10	3.50	54.40	190.40	8055.57
80.00	35.50	0.10	3.55	52.50	186.38	8241.94
82.00	37.00	0.10	3.70	50.70	187.59	8429.53
84.00	37.50	0.10	3.75	49.00	183.75	8613.28
86.00	38.00	0.10	3.80	47.40	180.12	8793.40
88.00	39.00	0.10	3.90	45.80	178.62	8972.02
90.00	40.50	0.10	4.05	44.30	179.42	9151.44
92.00	41.50	0.10	4.15	42.80	177.62	9329.06
94.00	42.50	0.10	4.25	41.40	175.95	9505.01
96.00	43.50	0.10	4.35	40.10	174.44	9679.44
98.00	45.00	0.10	4.50	38.80	174.60	9854.04
100.00	46.50	0.10	4.65	37.50	174.38	10028.42

SOUNDING 3 NASH ROAD LANDFILL

p-p1 spacing (feet)	dial reading (ohms)	scale multiplier	corrected reading (ohms)	*k (feet)	apparent resistivity (ohm-ft)	cumulative resistivity (ohm-ft)
2.00	9.00	0.01	0.09	2499.80	224.98	224.98
4.00	16.50	0.01	0.17	1249.50	206.17	431.15
6.00	25.00	0.01	0.25	832.60	208.15	639.30
8.00	32.00	0.01	0.32	624.00	199.68	838.98
10.00	41.00	0.01	0.41	498.80	204.51	1043.49
12.00	51.00	0.01	0.51	415.20	211.75	1255.24
14.00	55.00	0.01	0.55	355.40	195.47	1450.71
16.00	65.00	0.01	0.65	310.50	201.83	1652.53
18.00	75.50	0.01	0.76	275.50	208.00	1860.54
20.00	82.00	0.01	0.82	247.50	202.95	2063.49
22.00	89.50	0.01	0.90	224.50	200.93	2264.41
24.00	83.50	0.01	0.84	205.30	171.43	2435.84
26.00	102.00	0.01	1.02	189.10	192.88	2628.72
28.00	112.00	0.01	1.12	175.10	196.11	2824.83
30.00	120.00	0.01	1.20	162.90	195.48	3020.31
32.00	128.00	0.01	1.28	152.30	194.94	3215.26
34.00	138.50	0.01	1.39	142.80	197.78	3413.04
36.00	147.00	0.01	1.47	134.40	197.57	3610.60
38.00	155.50	0.01	1.56	126.80	197.17	3807.78
40.00	166.00	0.01	1.66	120.00	199.20	4006.98
42.00	175.50	0.01	1.76	113.80	199.72	4206.70
44.00	184.00	0.01	1.84	108.10	198.90	4405.60
46.00	193.50	0.01	1.94	102.90	199.11	4604.71
48.00	201.00	0.01	2.01	98.20	197.38	4802.09
50.00	213.00	0.01	2.13	93.80	199.79	5001.89
52.00	221.50	0.01	2.22	89.70	198.69	5200.57
54.00	231.00	0.01	2.31	85.80	198.20	5398.77
56.00	239.50	0.01	2.40	82.30	197.11	5595.88
58.00	248.00	0.01	2.48	79.00	195.92	5791.80
60.00	258.00	0.01	2.58	75.80	195.56	5987.36
62.00	268.00	0.01	2.68	72.90	195.37	6182.74
64.00	276.50	0.01	2.77	70.10	193.83	6376.56
66.00	285.50	0.01	2.86	67.50	192.71	6569.28
68.00	297.00	0.01	2.97	65.00	193.05	6762.33
70.00	308.50	0.01	3.09	62.70	193.43	6955.76
72.00	317.00	0.01	3.17	60.40	191.47	7147.22
74.00	329.00	0.01	3.29	58.30	191.81	7339.03
76.00	340.00	0.01	3.40	56.30	191.42	7530.45
78.00	349.00	0.01	3.49	54.40	189.86	7720.31
80.00	359.00	0.01	3.59	52.50	188.48	7908.78
82.00	370.00	0.01	3.70	50.70	187.59	8096.37
84.00	382.00	0.01	3.82	49.00	187.18	8283.55
86.00	395.00	0.01	3.95	47.40	187.23	8470.78
88.00	408.00	0.01	4.08	45.80	186.86	8657.65
90.00	420.00	0.01	4.20	44.30	186.06	8843.71
92.00	431.50	0.01	4.32	42.80	184.68	9028.39
94.00	443.00	0.01	4.43	41.40	183.40	9211.79
96.00	456.50	0.01	4.57	40.10	183.06	9394.85
98.00	468.00	0.01	4.68	38.80	181.58	9576.43
100.00	484.00	0.01	4.84	37.50	181.50	9757.93

SOUNDING 4 NASH ROAD LANDFILL

	dial reading (ohms)	scale multiplier	corrected reading (ohms)	*k (feet)	apparent resistivity (ohm-ft)	cumulative resistivity (ohm-ft)
2.00	5.50	0.10	0.55	224.80	123.64	123.64
4.00	10.50	0.10	1.05	112.00	117.60	241.24
6.00	12.50	0.10	1.25	74.30	92.88	334.12
8.00	183.00	0.01	1.83	55.30	101.20	435.31
10.00	248.50	0.01	2.49	43.80	108.84	544.16
12.00	227.00	0.01	2.27	36.00	81.72	625.88
14.00	342.00	0.01	3.42	30.40	103.97	729.85
16.00	16.50	0.10	1.65	26.10	43.07	772.91
18.00	39.00	0.10	3.90	22.80	88.92	861.83
20.00	52.00	0.10	5.20	20.00	104.00	965.83
22.00	58.00	0.10	5.80	17.70	102.66	1068.49
24.00	63.50	0.10	6.35	15.80	100.33	1168.82
26.00	79.00	0.10	7.90	14.10	111.39	1280.21
28.00	89.00	0.10	8.90	12.60	112.14	1392.35
30.00	97.00	0.10	9.70	11.30	109.61	1501.96

SOUNDING 5 NASH ROAD LANDFILL

	dial reading (ohms)	scale multiplier	corrected reading (ohms)	*k (feet)	apparent resistivity (ohm-ft)	cumulative resistivity (ohm-ft)
2.00	45.00	0.01	0.45	224.80	101.16	101.16
4.00	85.50	0.01	0.86	112.00	95.76	196.92
6.00	159.50	0.01	1.60	74.30	118.51	315.43
8.00	224.50	0.01	2.25	55.30	124.15	439.58
10.00	23.00	0.10	2.30	43.80	100.74	540.32
12.00	309.00	0.01	3.09	36.00	111.24	651.56
14.00	401.00	0.01	4.01	30.40	121.90	773.46
16.00	490.00	0.01	4.90	26.10	127.89	901.35
18.00	573.00	0.01	5.73	22.80	130.64	1032.00
20.00	63.50	0.10	6.35	20.00	127.00	1159.00
22.00	70.50	0.10	7.05	17.70	124.79	1283.78
24.00	79.50	0.10	7.95	15.80	125.61	1409.39
26.00	92.00	0.10	9.20	14.10	129.72	1539.11
28.00	97.00	0.10	9.70	12.60	122.22	1661.33
30.00	86.50	0.10	8.65	11.30	97.75	1759.08

SOUNDING 6 NASH ROAD LANDFILL

	dial reading (ohms)	scale multiplier	corrected reading (ohms)	*k (feet)	apparent resistivity (ohm-ft)	cumulative resistivity (ohm-ft)
2.00	2.00	0.10	0.20	224.80	44.96	44.96
4.00	88.00	0.01	0.88	112.00	98.56	143.52
6.00	140.50	0.01	1.41	74.30	104.39	247.91
8.00	195.50	0.01	1.96	55.30	108.11	356.02
10.00	20.00	0.10	2.00	43.80	87.60	443.62
12.00	29.50	0.10	2.95	36.00	106.20	549.82
14.00	36.50	0.10	3.65	30.40	110.96	660.78
16.00	43.50	0.10	4.35	26.10	113.54	774.32
18.00	51.00	0.10	5.10	22.80	116.28	890.60
20.00	48.50	0.10	4.85	20.00	97.00	987.60
22.00	61.00	0.10	6.10	17.70	107.97	1095.57
24.00	69.50	0.10	6.95	15.80	109.81	1205.38
26.00	79.00	0.10	7.90	14.10	111.39	1316.77
28.00	88.50	0.10	8.85	12.60	111.51	1428.28
30.00	98.50	0.10	9.85	11.30	111.31	1539.58

SOUNDING 7 NASH ROAD LANDFILL

	dial reading (ohms)	scale multiplier	corrected reading (ohms)	*k (feet)	apparent resistivity (ohm-ft)	cumulative resistivity (ohm-ft)
2.00	0.00	0.00	0.00	224.80	0.00	0.00
4.00	0.00	0.00	0.00	112.00	0.00	0.00
6.00	0.00	0.00	0.00	74.30	0.00	0.00
8.00	0.00	0.00	0.00	55.30	0.00	0.00
10.00	0.00	0.00	0.00	43.80	0.00	0.00
12.00	0.00	0.00	0.00	36.00	0.00	0.00
14.00	40.50	0.10	4.05	30.40	123.12	123.12
16.00	44.00	0.10	4.40	26.10	114.84	237.96
18.00	53.00	0.10	5.30	22.80	120.84	358.80
20.00	59.00	0.10	5.90	20.00	118.00	476.80
22.00	667.00	0.01	6.67	17.70	118.06	594.86
24.00	0.00	0.00	0.00	15.80	0.00	594.86
26.00	0.00	0.00	0.00	14.10	0.00	594.86
28.00	0.00	0.00	0.00	12.60	0.00	594.86
30.00	0.00	0.00	0.00	11.30	0.00	594.86

SOUNDING 8 NASH ROAD LANDFILL

	dial reading (ohms)	scale multiplier	corrected reading (ohms)	*k (feet)	apparent resistivity (ohm-ft)	cumulative resistivity (ohm-ft)
2.00	24.00	0.01	0.24	224.80	53.95	53.95
4.00	54.00	0.01	0.54	112.00	60.48	114.43
6.00	9.50	0.10	0.95	74.30	70.59	185.02
8.00	14.50	0.10	1.45	55.30	80.19	265.20
10.00	18.00	0.10	1.80	43.80	78.84	344.04
12.00	24.00	0.10	2.40	36.00	86.40	430.44
14.00	29.00	0.10	2.90	30.40	88.16	518.60
16.00	32.50	0.10	3.25	26.10	84.83	603.43
18.00	360.50	0.01	3.61	22.80	82.19	685.62
20.00	424.50	0.01	4.25	20.00	84.90	770.52
22.00	423.00	0.01	4.23	17.70	74.87	845.39
24.00	513.00	0.01	5.13	15.80	81.05	926.45
26.00	572.50	0.01	5.73	14.10	80.72	1007.17
28.00	630.50	0.01	6.31	12.60	79.44	1086.61
30.00	683.50	0.01	6.84	11.30	77.24	1163.85

SOUNDING 9 NASH ROAD LANDFILL

	dial reading (ohms)	scale multiplier	corrected reading (ohms)	*k (feet)	apparent resistivity (ohm-ft)	cumulative resistivity (ohm-ft)
2.00	0.00	0.00	0.00	224.80	0.00	0.00
4.00	0.00	0.00	0.00	112.00	0.00	0.00
6.00	0.00	0.00	0.00	74.30	0.00	0.00
8.00	0.00	0.00	0.00	55.30	0.00	0.00
10.00	0.00	0.00	0.00	43.80	0.00	0.00
12.00	24.00	0.10	2.40	36.00	86.40	86.40
14.00	25.50	0.10	2.55	30.40	77.52	163.92
16.00	26.00	0.10	2.60	26.10	67.86	231.78
18.00	30.00	0.10	3.00	22.80	68.40	300.18
20.00	29.00	0.10	2.90	20.00	58.00	358.18
22.00	415.00	0.01	4.15	17.70	73.46	431.64
24.00	0.00	0.00	0.00	15.80	0.00	431.64
26.00	0.00	0.00	0.00	14.10	0.00	431.64
28.00	0.00	0.00	0.00	12.60	0.00	431.64
30.00	0.00	0.00	0.00	11.30	0.00	431.64

SOUNDING 10 NASH ROAD LANDFILL

	dial reading (ohms)	scale multiplier	corrected reading (ohms)	*k (feet)	apparent resistivity (ohm-ft)	cumulative resistivity (ohm-ft)
2.00	0.00	0.00	0.00	224.80	0.00	0.00
4.00	0.00	0.00	0.00	112.00	0.00	0.00
6.00	0.00	0.00	0.00	74.30	0.00	0.00
8.00	0.00	0.00	0.00	55.30	0.00	0.00
10.00	0.00	0.00	0.00	43.80	0.00	0.00
12.00	302.00	0.01	3.02	36.00	108.72	108.72
14.00	356.00	0.01	3.56	30.40	108.22	216.94
16.00	426.00	0.01	4.26	26.10	111.19	328.13
18.00	482.00	0.01	4.82	22.80	109.90	438.03
20.00	547.50	0.01	5.48	20.00	109.50	547.53
22.00	622.00	0.01	6.22	17.70	110.09	657.62
24.00	0.00	0.00	0.00	15.80	0.00	657.62
26.00	0.00	0.00	0.00	14.10	0.00	657.62
28.00	0.00	0.00	0.00	12.60	0.00	657.62
30.00	0.00	0.00	0.00	11.30	0.00	657.62

SOUNDING 11 NASH ROAD LANDFILL

	dial reading (ohms)	scale multiplier	corrected reading (ohms)	*k (feet)	apparent resistivity (ohm-ft)	cumulative resistivity (ohm-ft)
2.00	0.00	0.00	0.00	224.80	0.00	0.00
4.00	0.00	0.00	0.00	112.00	0.00	0.00
6.00	0.00	0.00	0.00	74.30	0.00	0.00
8.00	0.00	0.00	0.00	55.30	0.00	0.00
10.00	0.00	0.00	0.00	43.80	0.00	0.00
12.00	310.50	0.01	3.11	36.00	111.78	111.78
14.00	366.00	0.01	3.66	30.40	111.26	223.04
16.00	414.00	0.01	4.14	26.10	108.05	331.10
18.00	481.50	0.01	4.82	22.80	109.78	440.88
20.00	551.00	0.01	5.51	20.00	110.20	551.08
22.00	618.50	0.01	6.19	17.70	109.47	660.55
24.00	0.00	0.00	0.00	15.80	0.00	660.55
26.00	0.00	0.00	0.00	14.10	0.00	660.55
28.00	0.00	0.00	0.00	12.60	0.00	660.55
30.00	0.00	0.00	0.00	11.30	0.00	660.55

SOUNDING 12 NASH ROAD LANDFILL

	dial reading (ohms)	scale multiplier	corrected reading (ohms)	*k (feet)	apparent resistivity (ohm-ft)	cumulative resistivity (ohm-ft)
2.00	0.00	0.00	0.00	224.80	0.00	0.00
4.00	0.00	0.00	0.00	112.00	0.00	0.00
6.00	0.00	0.00	0.00	74.30	0.00	0.00
8.00	0.00	0.00	0.00	55.30	0.00	0.00
10.00	0.00	0.00	0.00	43.80	0.00	0.00
12.00	22.00	0.10	2.20	36.00	79.20	79.20
14.00	26.00	0.10	2.60	30.40	79.04	158.24
16.00	30.00	0.10	3.00	26.10	78.30	236.54
18.00	34.00	0.10	3.40	22.80	77.52	314.06
20.00	42.00	0.10	4.20	20.00	84.00	398.06
22.00	50.50	0.10	5.05	17.70	89.39	487.45
24.00	0.00	0.00	0.00	15.80	0.00	487.45
26.00	0.00	0.00	0.00	14.10	0.00	487.45
28.00	0.00	0.00	0.00	12.60	0.00	487.45
30.00	0.00	0.00	0.00	11.30	0.00	487.45

ENGINEERING-SCIENCE, INC.
RESISTIVITY PROFILE DATA SHEET

Job No. _____ Date 6-1-84

Site Name Nash Rd Site Location Nash Rd.

Observer(s) Harman & Baker Comments (soil conditions, etc.) moist to wet

Equipment Used (name, serial #) Bison Electrode Array Method Used Wenner - Profile
(Battery check = 318.5) (29 milliampers)

Station Location	Electrode Spacing (feet)	2 π V/I (ohms)	Scale Multiplier	Corrected Reading (ohms)	Apparent Resistivity (ohm - feet)
P-1	10	9.0	1.0	9.0	90
P-1	20	5.5	1.0	5.5	110
P-1	30	3.0	1.0	3.0	90
P-1	50	29.5	0.1	2.95	147.5
P-1	70	26.0	0.1	2.6	182
P-2	10	86.0	0.1	8.6	86
P-2	20	49.5	0.1	4.95	99

Bison Unit: Apparent Resistivity = Electrode Spacing x (2π V/I x Scale Multiplier) where ( ) = Corrected Reading

6-1-84

Station Location	Electrode Spacing (feet)	2 π V/I (ohms)	Scale Multiplier	Corrected Reading (ohms)	Apparent Resistivity (ohm - feet)
P-2	30	37.5	0.1	3.75	112.5
P-2	50	30.5	0.1	3.05	152.5
P-2	70	25.0	0.1	2.5	175.0
P-3	10	86	0.1	8.6	86.0
P-3	20	50	0.1	5.0	100.0
P-3	30	38.5	0.1	3.85	115.5
P-3	50	29.5	0.1	2.95	147.5
P-3	70	27.5	0.1	2.75	192.5
P-4	10	75	0.1	7.5	75.0
P-4	20	44.5	0.1	4.45	89.0

Station Location	Electrode Spacing (feet)	2 π V/I (ohms)	Scale Multiplier	Corrected Reading (ohms)	Apparent Resistivity (ohm - feet)
P-4	30	32.5	0.1	3.25	97.5
P-4	50	27.5	0.1	2.75	137.5
P-4	70	25.0	0.1	2.5	175.0
P-5	10	98.5	0.1	9.85	98.5
P-5	20	51.5	0.1	5.15	103.0
P-5	30	36.5	0.1	3.65	109.5
P-5	50	30.0	0.1	3.0	150.0
P-5	70	25.5	0.1	2.55	178.5
P-6	10	116.0	0.1	11.6	116.0
P-6	20	56.5	0.1	5.65	113.0

Station Location	Electrode Spacing (feet)	2 π V/I (ohms)	Scale Multiplier	Corrected Reading (ohms)	Apparent Resistivity (ohm - feet)
P-6	30	41.5	0.1	4.15	124.5
P-6	50	30.0	0.1	3.0	150.0
P-6	70	26.0	0.1	2.6	182.0
P-7	10	110.0	0.1	11.0	110.0
P-7	20	54.0	0.1	5.4	108.0
P-7	30	40.5	0.1	4.05	121.5
P-7	50	26.0	0.1	2.6	130.0
P-7	70	24.5	0.1	2.45	171.5
P-8	10	114.0	0.1	11.4	114
P-8	20	53.5	0.1	5.35	107

6-1-84

Station Location	Electrode Spacing (feet)	2π V/I (ohms)	Scale Multiplier	Corrected Reading (ohms)	Apparent Resistivity (ohm - feet)
P-8	30	40.0	0.1	4.0	120
P-8	50	30.0	0.1	3.0	150
P-8	70	28.0	0.1	2.8	196
P-9	10	146.0	0.1	14.6	146
P-9	20	48.5	0.1	4.85	97
P-9	30	41.0	0.1	4.10	123
P-9	50	31.0	0.1	3.1	155
P-9	70	27.5	0.1	2.75	192.5
P-10	10	146.0	0.1	14.6	146
P-10	20	62.5	0.1	6.25	125

6-1-84

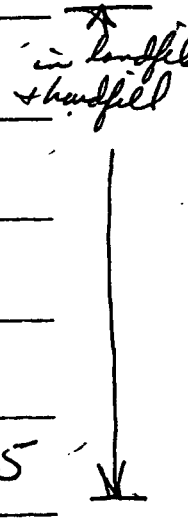
Station Location	Electrode Spacing (feet)	2π V/I (ohms)	Scale Multiplier	Corrected Reading (ohms)	Apparent Resistivity (ohm - feet)
P-10	30	44.0	0.1	4.4	132
P-10	50	32.0	0.1	3.2	160
P-10	70	28.5	0.1	2.85	199.5
P-11	10	183.5	0.1	18.35	183.5
P-11	20	70.5	0.1	7.05	141
P-11	30	46.0	0.1	4.6	138
P-11	50	294.0	0.01	2.94	147
P-11	70	294.0	0.01	2.94	205.8
P-12	10	187.5	0.1	18.75	187.5
P-12	20	66.5	0.1	6.65	133

6-1-84

Station Location	Electrode Spacing (feet)	2 π V/I (ohms)	Scale Multiplier	Corrected Reading (ohms)	Apparent Resistivity (ohm - feet)
P-12	30	44	0.1	4.4	132
P-12	50	32.0	0.1	3.2	160
P-12	70	29.5	0.1	2.95	206.5
P-13	10	180.0	0.1	18	180
P-13	20	66.5	0.1	6.65	133
P-13	30	373.0	0.01	3.73	111.9
P-13	50	26.0	0.1	2.6	130
P-13	70	244	0.01	2.44	170.8
P-14	10	177.5	0.1	17.75	177.5
P-14	20	624.0	0.01	6.24	124.8

Station Location	Electrode Spacing (feet)	2 π V/I (ohms)	Scale Multiplier	Corrected Reading (ohms)	Apparent Resistivity (ohm - feet)
P-14	30	436.5	0.01	4.365	131.0
P-14	50	315.5	0.01	3.155	157.8
P-14	70	293.5	0.01	2.935	205.4
P-15	10	194.5	0.1	19.45	194.5
P-15	20	63.0	0.1	6.3	126
P-15	30	33.0	0.1	3.3	99
P-15	50	31.0	0.1	3.1	155
P-15	70	269.0	0.01	2.69	188.3
P-16	10	114.0	0.1	11.4	114
P-16	20	55.0	0.1	5.5	110

Station Location	Electrode Spacing (feet)	2 π V/I (ohms)	Scale Multiplier	Corrected Reading (ohms)	Apparent Resistivity (ohm - feet)
P-16	30	41	0.1	4.1	123
P-16	50	31.5	0.1	3.15	157.5
P-16	70	272.5	0.01	2.725	190.75
P-17	10	48	0.1	4.8	48
P-17	20	37	0.1	3.7	74
P-17	30	31.0	0.1	3.1	93
P-17	50	26	0.1	2.6	130
P-17	70	23.5	0.1	2.35	164.5
P-18	10	797.5	0.01	7.975	79.75
P-18	20	41.5	0.1	4.15	83



6-1-84

Station Location	Electrode Spacing (feet)	2π V/I (ohms)	Scale Multiplier	Corrected Reading (ohms)	Apparent Resistivity (ohm - feet)
P-18	30	29.5	0.1	2.95	~~89.4~~ 88.5
P-18	50	27	0.1	2.7	135
P-18	70	24	0.1	2.4	168
P-19	10	5,5	1.0	5,5	55
P-19	20	23.5	0.1	2.35	47
P-19	30	26.0	0.1	2.6	78
P-19	50	23	0.1	2.3	115
P-19	70	24	0.1	2.4	168
P-20	10	124,5	0.1	12.45	124.5
P-20	20	56.5	0.1	5.65	113.0

6-1-84

Station Location	Electrode Spacing (feet)	2 π V/I (ohms)	Scale Multiplier	Corrected Reading (ohms)	Apparent Resistivity (ohm - feet)
P-20	30	41.0	0.1	4.1	123
P-21	10	138.5	0.1	13.85	138.5
P-21	20	61.0	0.1	6.1	122
P-21	30	43.0	0.1	4.3	129
P-21	50	37.0	0.1	3.7	185
P-21	70	32.0	0.1	3.2	224
P-22	10	146.5	0.1	14.65	146.5
P-22	20	63	0.1	6.3	126
P-22	30	46	0.1	4.6	138
P-22	50	39.5	0.1	3.95	197.5

6-1-84

Station Location	Electrode Spacing (feet)	2π V/I (ohms)	Scale Multiplier	Corrected Reading (ohms)	Apparent Resistivity (ohm - feet)
P-22	70	33	0.1	3.3	231
P-23	10	55	0.1	5.5	55
P-23	20	39	0.1	3.9	78
P-23	30	38	0.1	3.8	114
P-23	50	24	0.1	2.4	120
P-23	70	28	0.1	2.8	196
P-24	10	91.5	0.1	9.15	91.5
P-24	20	423	0.01	4.23	~~84.2~~ 84.6
P-24	30	388	0.01	3.88	116.4
P-24	50	321	0.01	3.21	160.5

Landfill area

6-1-84

Station Location	Electrode Spacing (feet)	2 π V/I (ohms)	Scale Multiplier	Corrected Reading (ohms)	Apparent Resistivity (ohm - feet)
P-24	70	266	0.01	2.66	1862

ENGINEERING-SCIENCE
MAGNETOMETER DATA SHEET

Job No. 36330 Date 5-30-84

Site Name and Location Nash Rd., N.Y.

Observer(s) Harman & Baker (ES)

Base Station Location In wooded area. / N55°W + 178' from B2

Equipment Used (name, serial #) Geometrics # 816/826A #6673 (10 Battery Checks)

Traverse Identification	Orientation (Compass Heading)	Station Identification	Time (24-hr Clock)	Reading (Gamma)
	N	Base Station	0850	57111
	S	"		57116
	E	"		57119
	W	"		57119
A	North	Mag. Hut (P.L) TL		58810
	40'	A1		58052
	"	A2		57293
	"	A3		57331
	"	A4 (woods)(TL)		57059
	S 80°E from A (40')			
B	North	B (PL) TL		58396
	40'	B1		58002
	"	B2		57178
	"	B3		57169
	"	B4		57252
	"	B5		57169
	"	B6		57343
C	due East 40' from B	C TL		57426
	North 40'	C1		57348
	40'	C2		57574
	"	C3		58146
	"	C4		57384
	"	C5		57459
	"	C6		57529
	"	C7		57505
	"	C8		57233
	"	C9 (SWR) w\ Gas		57595
D	due East 40' from C	D (TL)		57662
	North 40'	D1		57646
	"	D2		58052
	"	D3		57152
	"	D4		57186
	"	D5		57244
	"	D6 (SW)		57162

P.L. : Power line near
TL Tree line

SWR : Standing water, reed (SWL)
G = gas

ENGINEERING-SCIENCE
MAGNETOMETER DATA SHEET

Job No. 36330 Date 5-30-84

Site Name and Location Nash Rd., N.Y.

Observer(s) Harman + Baker (ES)

Base Station Location

Equipment Used (name, serial #)

Traverse Identification	Orientation (Compass Heading)	Station Identification	Time (24-hr Clock)	Reading (Gamma)
D	North 40'	D7 (SW)		56640
	"	D8 (SW)		56903
	"	D9		57431
	"	D10		57312
	"	D11 (SW)		57176
E	East 40' of D11	E		57213
	South 40'	E1		57680
	40'	E2		56980
	"	E3 (SW) Pits		57679
	"	E4 (SW) "		57219
	"	E5 (SW) "		57729
	"	E6 (SW) Pits		57361
	"	E7 SW Pit		57134
	"	E8		57082
	"	E9		57705
	"	E10		57829
	"	E11 (TL)		57573
X		over pipe line		58623
		under power line		58295
F	40° due East of E11	F		57645
	North 40'	F1		57481
	"	F2		57085
	"	F3 (SW) Pit		57083
	"	F4 (SW) Pit		57480
	"	F5 (SW) Pit		57009
	"	F6 (SW) Pit		57451
	"	F7 "		56917
	"	F8 "		57119
	"	F9		57230
	"	F10		57322
	"	F11 (SW) Pit (L)		57298
G	due East 40' of F11	G		56375
	South 40'	G1		57387
	"	G2		57673
	"	G3 (SW) Pit		57834

p: pit

ENGINEERING-SCIENCE
MAGNETOMETER DATA SHEET

Job No. 36330 Date 5-30-84

Site Name and Location Nash Rd, N.Y.

Observer(s) Hamer + Baker (ES)

Base Station Location

Equipment Used (name, serial #)

Traverse Identification	Orientation (Compass Heading)	Station Identification	Time (24-hr Clock)	Reading (Gamma)
G	South 40'	G4	(SW) Pit	58507
	"	G5	"	57425
	"	G6	(SW) Pit	56910
	"	G7	(SW) Pit	58175
	"	G8	(SW) Pit	57100
	"	G9		57455
	"	G10	(SW) Pit	52359
	"	G11	(SW) Pit	57927
H	due East 40' of G11	H	(20' to TL)	57429
	North 40'	H1	(SW) Pit	58001
	"	H2	(SW)	56798
	"	H3		57550
	"	H4	(SW-R)(L)	56834
	"	H5	SW-R(L)	56616
	"	H6	SW	59107/59110
	"	H7	SW	57777
	"	H8		57095
	"	H9		57372
	"	H10		56773
	"	H-11		56562
I	East 40' of H-11	I		55975
	South 40'	I-1		57049
	"	I-2		57043
	"	I-3		57654
	"	I-4	(SW)	57214
	"	I-5	(SW)	57801
	"	I-6	"	57006
	"	I-7	"	56929
	"	I-8	"	56976
	"	I-9	"	57194
	"	I-10	" (P;t)	57014
	"	I-11	" " (20' to TL)	57873

ENGINEERING-SCIENCE
MAGNETOMETER DATA SHEET

Job No. 36330 Date 5-30-84

Site Name and Location Nash Road, N.Y.

Observer(s) Baker & Harman (ES)

Base Station Location

Equipment Used (name, serial #)

Traverse Identification	Orientation (Compass Heading)	Station Identification	Time (24-hr Clock)	Reading (Gamma)
J	East 40' of I-11	J		58193
	North 40'	J-1 (SW)	Pit	56819
	"	J-2		57018
	"	J-3	SW Gas Bubbles	57351
	"	J-4	SW	56957
	"	J-5	SW	57231
	"	J-6	SW	57014
	"	J-7	SW	57311
	"	J-8		58252
	"	J-9		57327
	"	J-10		57696
	"	J-11	SW ~~R~~ L Ditch (TL)	56125
K	East 40' of J-10	K	SW ~~R~~ L Ditch (TL)	57057
	South 40'	K-1	(SW ~~R~~) L	57638
	"	K-2	(SW ~~R~~) L	57619
	"	K-3		57321
	"	K-4	SW (ET) (White Pile)	57141
	"	K-5	SW	57482
	"	K-6		57230
	"	K-7		57114
	"	K-8		57232
	"	K-9		57177
	"	K-10	SW (Pit)	57502
	"	K-11		57167
	"	K-12	SW ~~R~~ L (PL) (TL)	58636
L	East 40' of K-12	L	SW ~~R~~ (TL)	57111
	North 40'	L-1		57538
	"	L-2	SW Pit	57145
	"	L-3		57424
	"	L-4		56976
	"	L-5		57126
	"	L-6	SW	57289
	"	L-7	SW	57050
	"	L-8		57079
	"	L-9		57088

ENGINEERING-SCIENCE
MAGNETOMETER DATA SHEET

Job No. 36.330 Date 5-30-84

Site Name and Location Nash Rd, N.Y.

Observer(s) Harman + Baker (ES)

Base Station Location

Equipment Used (name, serial #)

Traverse Identification	Orientation (Compass Heading)	Station Identification	Time (24-hr Clock)	Reading (Gamma)
L	North 40'	L-10	(SW) RL	57454
	"	L-11	SW RL (small of organics) (OS)	57574
	"	L-12	SW RL (TL)	56542
M	East 40' of L-11	M	SW RL (Gas Bubbles)	57171
	South 40'	M-1	SW RL	57434
	"	M-2	SW RL	57125
	"	M-3		56907
	"	M-4	SW RL	57320
	"	M-5	(ET)	57306
	"	M-6	SW	57576
	"	M-7		57844
	"	M-8	SW R (Gas Bubbles)	57367
	"	M-9		57776
	"	M-10	SW Pit	58062
	"	M-11	SW RL	58574
N	East 40' of M	N	SW	56834
	North 40'	N-1	SW Pit	58026
	"	N-2		57391
	"	N-3	SW R	57413
	"	N-4	SW	57425
	"	N-5	SW (ET)	57858
	"	N-6	SW	57411
	"	N-7	SW RL	57444
	"	N-8	ET	57224
	"	N-9	ET	57223
	"	N-10	SW RL	57538
	"	N-11	SW RL (TL)	57389
O	East 40' of N-10	O	SW RL	57019
	South 40'	O-1		57336
	"	O-2	ET	56964
	"	O-3		57197
	"	O-4		57006
	"	O-5		57163
	"	O-6		57253
	"	O-7		58054

ET : exposed trash

ENGINEERING-SCIENCE
MAGNETOMETER DATA SHEET

Job No. 36330 Date 5-30-84

Site Name and Location Nash Rd., N.Y.

Observer(s) Baker + Harman (ES)

Base Station Location

Equipment Used (name, serial #)

Traverse Identification	Orientation (Compass Heading)	Station Identification	Time (24-hr Clock)	Reading (Gamma)
O	South 40'	O-8		57444
	"	O-9 SW of P,4 (Eastern limit of pits)		57208
	X	~~O-10~~		
P	East 40' of O-9	P		57774
	North 40'	P-1		57148
	"	P-2		57777
	"	P-3		58810
	"	P-4		57777
	"	P-5		56975
	"	P-6		57391
	"	P-7		57381
	"	P-8		57541
	"	P-9 (SW R) X		57400
	"	R-10 (Ditch)		56623
Q	East 40' of P-9	Q		57057
	South 40'	Q-1		57216
	"	Q-2 ET		57525
	"	Q-3		56853
	"	Q-4		57341
	"	Q-5		57041
	"	Q-6		57930
	"	Q-7		57250
	"	Q-8		56738
	"	Q-9		57296
	"	Q-10 (Phone Co, stake ?)		57295
R	East 40' of Q-9	R		57118
		~~R (minus t)~~		
	North 40'	R-1		57228
	"	R-2		57193
	"	R-3		57835
	"	R-4 (ED)		57923
	"	R-5		57363
	"	R-6		57335
	"	R-7		57390
	"	R-8		57138

ED : Earth Depression

ENGINEERING-SCIENCE
MAGNETOMETER DATA SHEET

Job No. 36330 Date 5-30-84

Site Name and Location Nash Rd., N.Y.

Observer(s) Baker & Harman (ES)

Base Station Location

Equipment Used (name, serial #)

Traverse Identification	Orientation (Compass Heading)	Station Identification	Time (24-hr Clock)	Reading (Gamma)
R	North 40'	R-9 (20' to TL + SW R)		57016
S	East 40' of R-9	S	"	57628
	South 40'	S-1		57059
	"	S-2		57247
	"	S-3		57445
	"	S-4		57374
	"	S-5		57409
	"	S-6 (ET)		57321
	"	S-7		57225
	"	S-8		57199
	"	S-9 (West end of trench)		57448
	"	S-10 (SW)		57258
T	East 40' of S-10	T		57328
	North 40'	T-1 (~~in pit~~ - 25' wide) (SW w/ Gas Bubbles)		57496
	N-40'	T-2		57308
	"	T-3		57485
	"	T-4 (ET)		57416
	"	T-5 (ET)		57711
	"	T-6 (ET)		57267
	"	T-7 (ET)		56999
	"	T-8		57598
	"	T-9		57382
	"	T-10	SW R (20' to TL)	57621
U	East 40' of T-10	U	(SW R)	56852
	South 40'	U-1		57153
	"	U-2		57379
	"	U-3		57475
	"	U-4		57077
	"	U-5		57150
	"	U-6		57163
	"	U-7		57763
	"	U-8		57202
	"	U-9 SW	Pit (Battery Cases) (BC)	57746
	"	U-10		57351

T = Trench

ENGINEERING-SCIENCE
MAGNETOMETER DATA SHEET

Job No. 36330 Date 5-30-84

Site Name and Location Nash Road. N.J.

Observer(s) Baker & Harman (ES)

Base Station Location

Equipment Used (name, serial #)

Traverse Identification	Orientation (Compass Heading)	Station Identification	Time (24-hr Clock)	Reading (Gamma)
U	South 40'	U-11		57052
V	East 40' of U-11	V		57333
	North 40'	V-1	(Gas pipeline sign?)	58004
	"	V-2	SW (pit)	57331
	"	V-3		57575
	"	V-4		57554
	"	V-5		57515
	"	V-6	(ET)	57417
	"	V-7		57520
	"	V-8	(ET)	57490
	"	V-9		57690
	"	V-10	(SW-RA)	56989
W	East 40' of V-10	W	(SW-RA)	56499
	South 40'	W-1		57824
	"	W-2	(ED)	57313
	"	W-3		57691
	"	W-4		57802
	"	W-5		57317
	"	W-6	(ET)	57689
	"	W-7		57441
	"	W-8		57390
	"	W-9		57293
	"	W-10		57029
X	East 40' of W-10	X		57072
	North 40'	X-1	SW-ED	57528
	"	X-2		57223
	"	X-3		57585
	"	X-4	(ED) (AC)	57806
	"	X-5	(ED) (Battery cases)	57628
	"	X-6	(ED)	57390
	"	X-7		57305
	"	X-8		57436
	"	X-9		57286
	"	X-10	West end of ED (ET)	56561

ENGINEERING-SCIENCE
MAGNETOMETER DATA SHEET

Job No. 36330 Date 5-30-84

Site Name and Location Nash Rd., N.Y.

Observer(s) Harman & Baker (ES)

Base Station Location N 55°W, 178 feet from B-2

Equipment Used (name, serial #) Geometrics 816/826A #6673

Traverse Identification	Orientation (Compass Heading)	Station Identification	Time (24-hr Clock)	Reading (Gamma)
Y	East 40' of X-10	Y SW	R (ET) (BC)	57093
	South 40'	Y-1	ET (Battery cover)	56733
	"	Y-2	"	57117
	"	Y-3	(ET)	58031
	"	Y-4		57553
	"	Y-5		57022
	"	Y-6	(ED)	57343
	"	Y-7		57952
	"	Y-8	(ED)	57288
	"	Y-9	SW (pit)	57746
	"	Y-10		57143
	"	Y-11		57114
Z	East 40' of Y-11	Z		57597
	North 40'	Z-1		
	N	Base Station	1040	57066
	S			57067
	E			57067
	W			57064

ENGINEERING-SCIENCE
MAGNETOMETER DATA SHEET

Job No. 36330 Date 5-31-84

Site Name and Location Nash Rd., N.Y.

Observer(s) Baker & Harman

Base Station Location

Equipment Used (name, serial #) Geometrics 816/826A # 6673
(Battery check 10)

Traverse Identification	Orientation (Compass Heading)	Station Identification	Time (24-hr Clock)	Reading (Gamma)
	N	MAG Base	0820	56 988
	S	"		56 989
	E	"		56 989
	W	"		56 990
	North	Z		57 554
	N 40'	Z-1		56 979
	"	Z-2	(ED)	57 901
	"	Z-3	(ED)	57 573
	"	Z-4		57 298
	"	Z-5		57 002
	"	Z-6		57 121
	"	Z-7		56 932
	"	Z-8	(Battery Case)	57 471
	"	Z-9	(ET)	57 018
	"	Z-10	(EP)	56 900
	South (E-40')	AA	(Battery Cover) (N20° from EP)	57 431
	S 40'	AA-1	(" " ")	57 546
	"	AA-2	(" " ")	57 056
	"	AA-3		57 313
	"	AA-4		57 626
	"	AA-5		57 413
	"	AA-6		57 300
	"	AA-7		57 424
	"	AA-8		56 802
	"	AA-9		57 720
	"	AA-10	(TL)	57 422
	North (E-40')	BB	(TL) (SW)	56 984
	N 40'	BB-1		57 195
	"	BB-2		57 112
	"	BB-3		57 387
	"	BB-4		57 212
	"	BB-5		57 908
	"	BB-6		57 907
	"	BB-7		57 128

EP = EDGE OF POND

ENGINEERING-SCIENCE
MAGNETOMETER DATA SHEET

Job No. 36330 Date 5-31-84

Site Name and Location Nash Rd, N.Y.

Observer(s) Baker & Harman

Base Station Location

Equipment Used (name, serial #)

Traverse Identification	Orientation (Compass Heading)	Station Identification	Time (24-hr Clock)	Reading (Gamma)
	N 40'	BB-8	(ET)	57307
	"	BB-9	(Battery Cases)	56959
	"	BB-10	(EP) (Battery Cases)	57113
	South (E-40')	CC	Battery Cases (N30'N-EP)	57192
	S 40'	CC-1	(ET)	57270
	"	CC-2		57591
	"	CC-3		57619
	"	CC-4	(ET)	57061
	"	CC-5		57452
	"	CC-6		57338
	"	CC-7		57043
	"	CC-8		57144
	"	CC-9	(SW)	57073
	"	CC-10	(SW)	57334
	North (E-40')	DD		57371
	N 40'	DD-1	(SW)	57211
	"	DD-2		57323
	"	DD-3		57158
	"	DD-4		57245
	"	DD-5		57369
	"	DD-6		57224
	"	DD-7		57267
	"	DD-8		57693
	"	DD-9	(ET)	57066
	"	DD-10	(ET) (EP)	56964
	South (E-40')	EE	(ET) (N30'N-EP)	57394
	S 40'	EE-1	(ET)	57329
	"	EE-2	(ET)	57126
	"	EE-3	(ET) (ED)	57271
	"	EE-4		57169
	"	EE-5	(ED)	57589
	"	EE-6	(SW RA)	56935
	"	EE-7	(SW)	57569
	"	EE-8	(SW) (TL)	57304
	North (E-40')	FF	(ET)	57169

ENGINEERING-SCIENCE
MAGNETOMETER DATA SHEET

Job No. _____ Date 5-31-84

Site Name and Location Nash Rd; N.Y.

Observer(s) Baker & Harman

Base Station Location _____

Equipment Used (name, serial #) _____

Traverse Identification	Orientation (Compass Heading)	Station Identification	Time (24-hr Clock)	Reading (Gamma)
	N 40'	FF-1		57162
	"	FF-2		57435
	"	FF-3	(ED) (SW)	57305
	"	FF-4	(SW)	57147
	"	FF-5	(ED)	57414
	"	FF-6	(ED) (ET)	57520
	"	FF-7	(ET)	57150
	N 30'	FF-8	(EP) (ET)	57407 (Drum
	South (E-40')	GG	(EP) (ET) (Drum)	57214
	S 40'	GG-1	(EP) (Pit Area?)	57043
	"	GG-2	(SW) Pit Area	56989 ~30' wid
	"	GG-3		57446
	"	GG-4	(SW) (Pit Area?)	57675 ~20' wi
	"	GG-5		57520
	"	GG-6		57549
	North (E-40')	HH	(SW) TL	~~57354~~ 57292
	N 40'	HH-1	(SW)	57354
	"	HH-2		57533
	"	HH-3	(SW)	57293
	"	HH-4		57659
	"	HH-5	(SW) Pit Area	56889
	"	HH-6	(EP)	57114
	South (E-40')	II-	Pit Area (EP)	57245
	S 40'	II-1		57406
	"	II-2		57295
	"	II-3		57560
	"	II-4		57257
	"	II-5	(TL)	57184
	North (E-40')	JJ		57299
	N 40'	JJ-1		57265
	"	JJ-2		57411
	"	JJ-3	(ED)	56903
	"	JJ-4		57178
	"	JJ-5		57603
	"	JJ-6		57694

ENGINEERING-SCIENCE
MAGNETOMETER DATA SHEET

Job No. _____ Date 5-31-84

Site Name and Location Nash Rd.

Observer(s) Bulzer & Harman

Base Station Location _____

Equipment Used (name, serial #) _____

Traverse Identification	Orientation (Compass Heading)	Station Identification	Time (24-hr Clock)	Reading (Gamma)
	N40'	JJ-7	(SW EP) Battery Cable	58178 / 58168
	"	JJ-8	(EP) EAST	57220
	"	JJ-9	~30'E of EP	57250
	"	JJ-10		57198
	W 40'	II-6	Drainage Ditch (EP)	57104
	"	HH-7	(N EP)	57241
	"	GG-7	EP	57250
	South (E-40')	KK		57262
	S40'	KK-1		57158
	"	KK-2	(ED)	57004
	"	KK-3	(SW)	56865
	"	KK-4	(ED) (SW)	57567
	"	KK-5		57853
	"	KK-6		57523
	"	KK-7	(ED?)	57710
	"	KK-8		58165 / 58129
	"	KK-9		57828
	"	KK-10	(TL)	57410
	North (E-40')	LL	(TL)	57800
	N40'	LL-1	(TL)	57908
	"	LL-2	(TL) (SW)	57313
	"	LL-3	(TL)	57634
	"	LL-4	(TL) (ED) (SW)	58521 / 58491
	"	LL-5		57990
	"	LL-6	(SW) (ED)	57325
	"	LL-7	(SW) & Bubbles	57608
	"	LL-8	(ED) (SW)	56810
	"	LL-9		57171
	South (E-40')	MM	(TL)	57142
	S-40'	MM-1	(SW) (ED) (TL)	56818
	"	MM-2	(SW) (ED) (TL)	57456
	"	MM-3	(TL)	57109
	"	MM-4	(TL)	57089
	"	MM-5	(TL)	57164

ENGINEERING-SCIENCE
MAGNETOMETER DATA SHEET

Job No. _____ Date 5-31-84

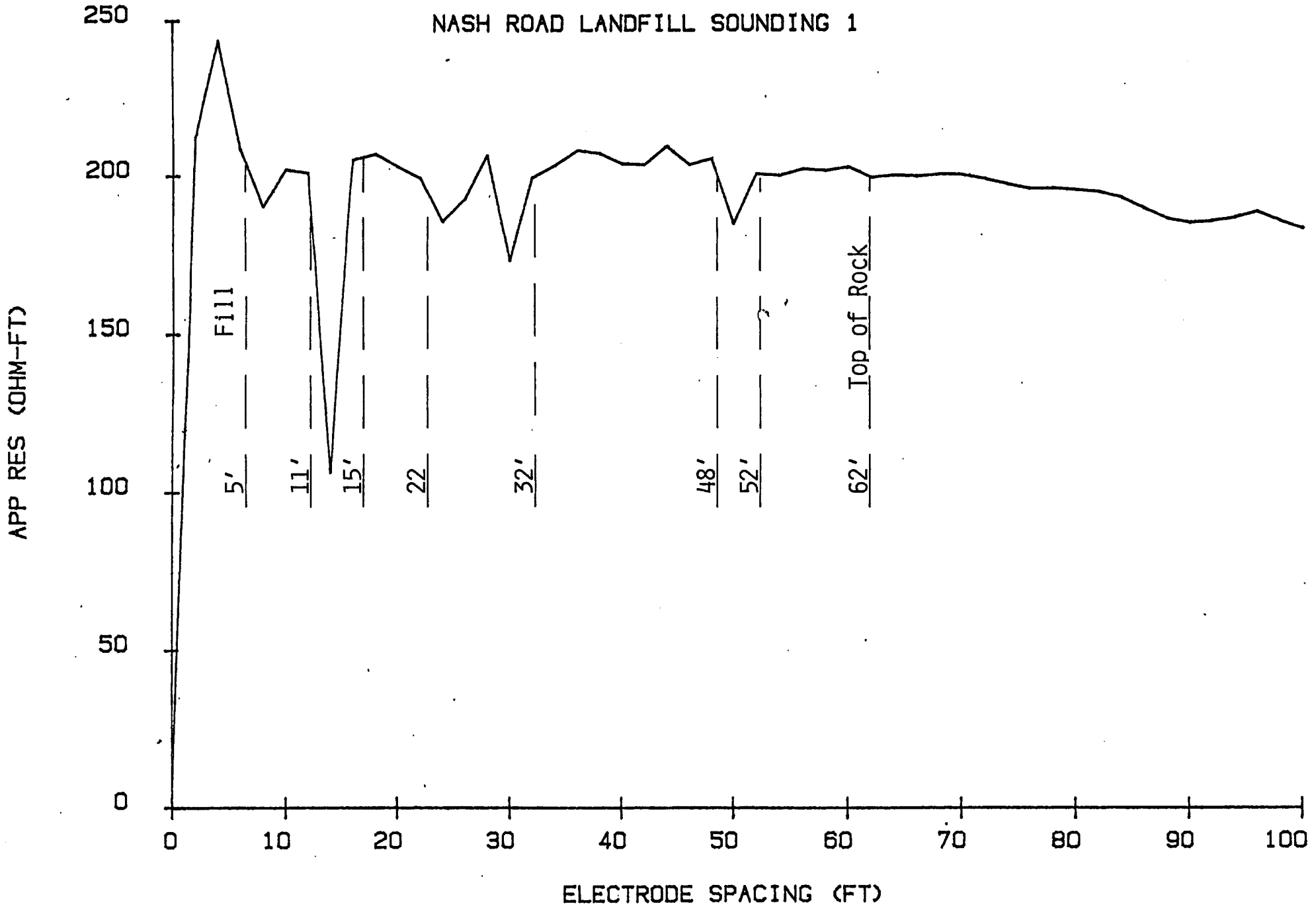
Site Name and Location Nash Rd.

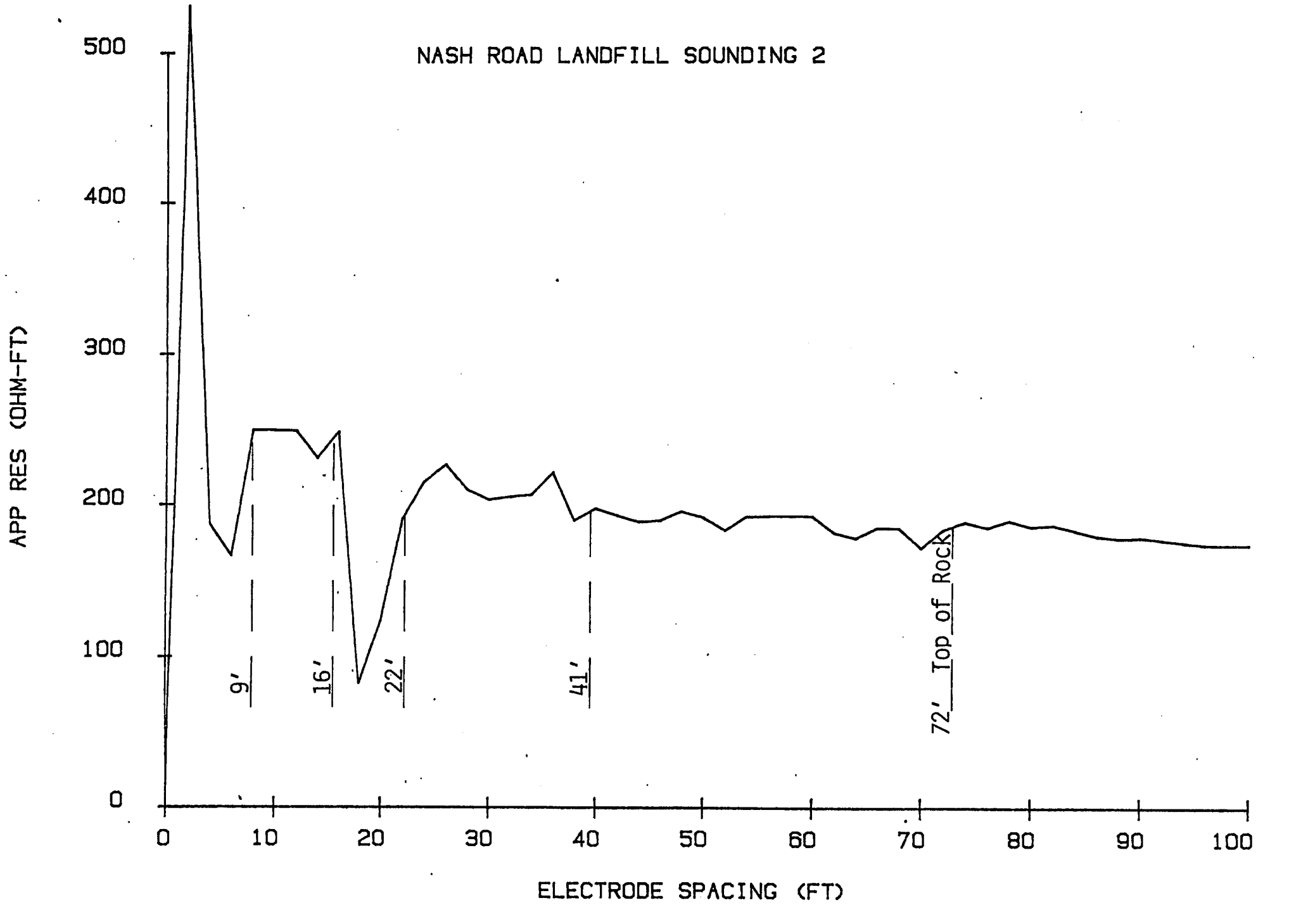
Observer(s) Harman & Baker

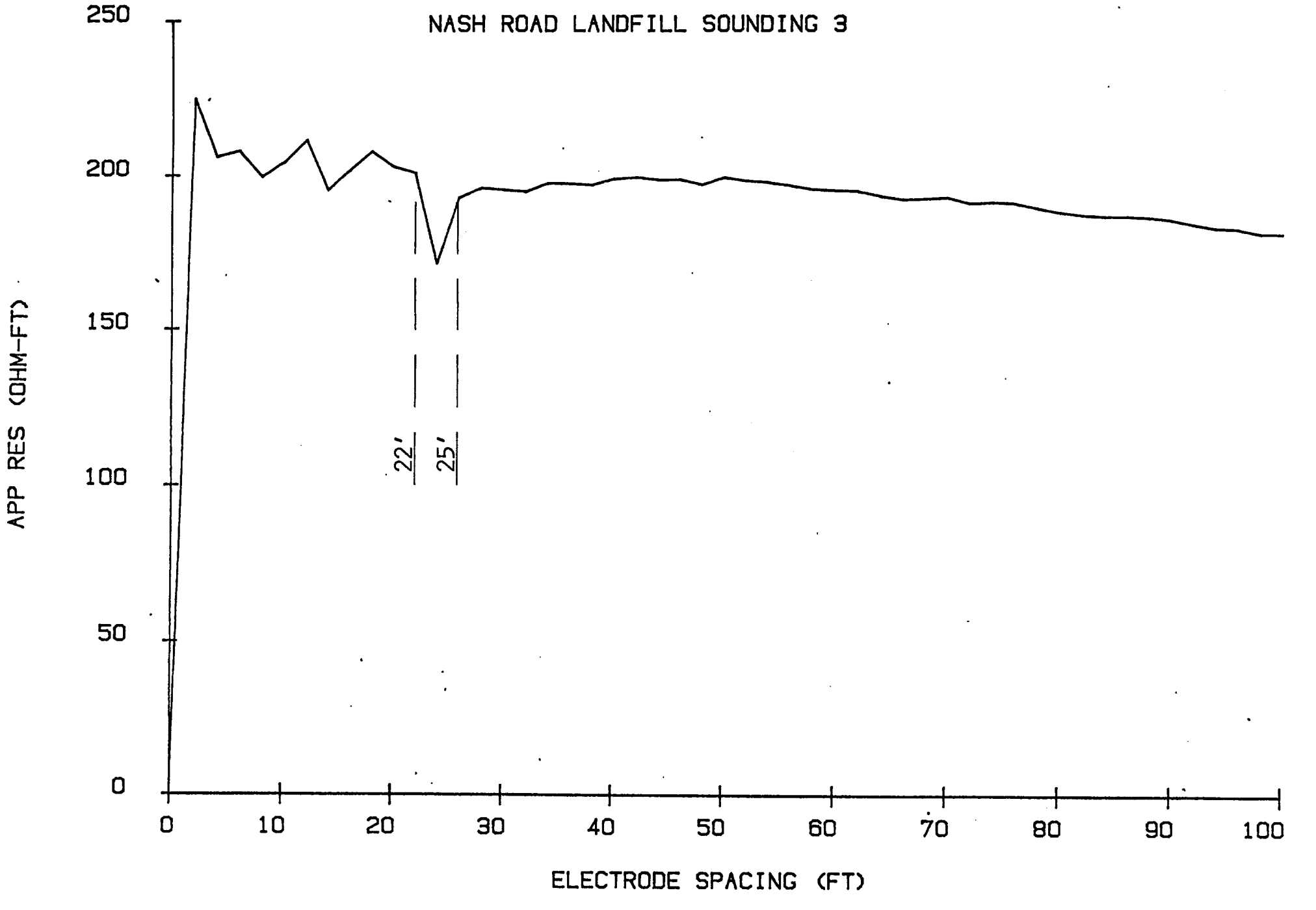
Base Station Location _____

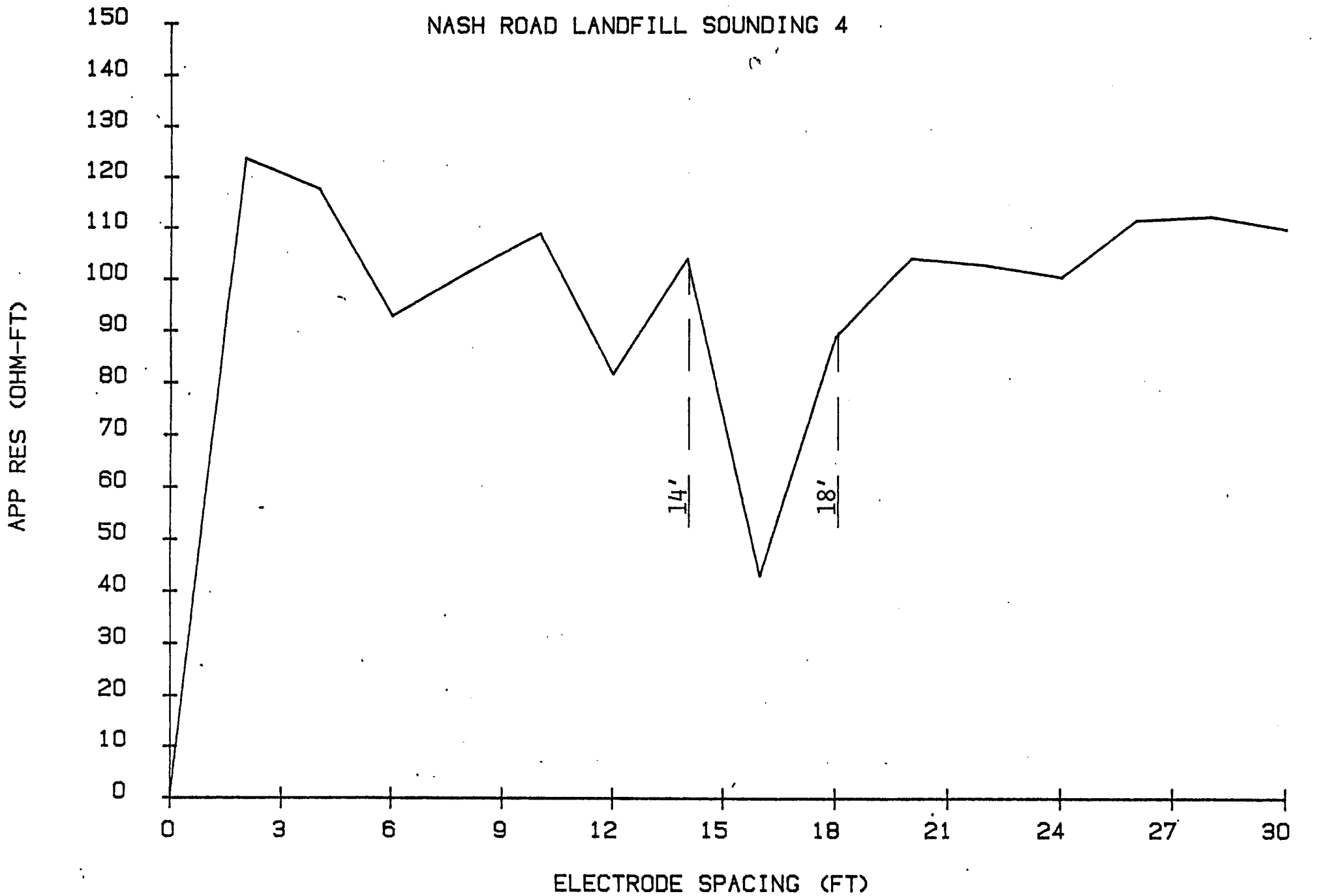
Equipment Used (name, serial #) _____

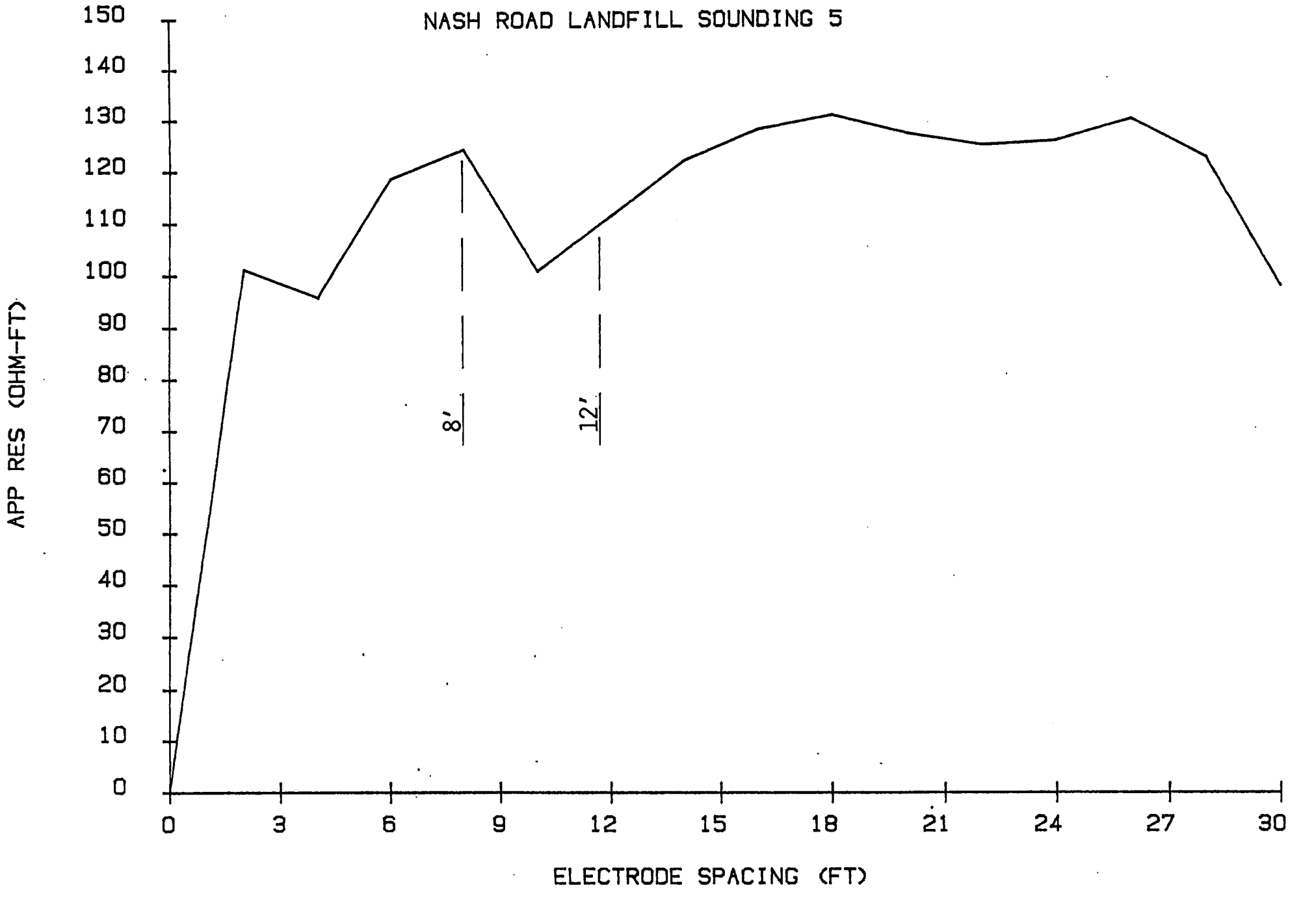
Traverse Identification	Orientation (Compass Heading)	Station Identification	Time (24-hr Clock)	Reading (Gamma)
	N	MAG Base		57021
	S			57020
	E			57019
	W			57018

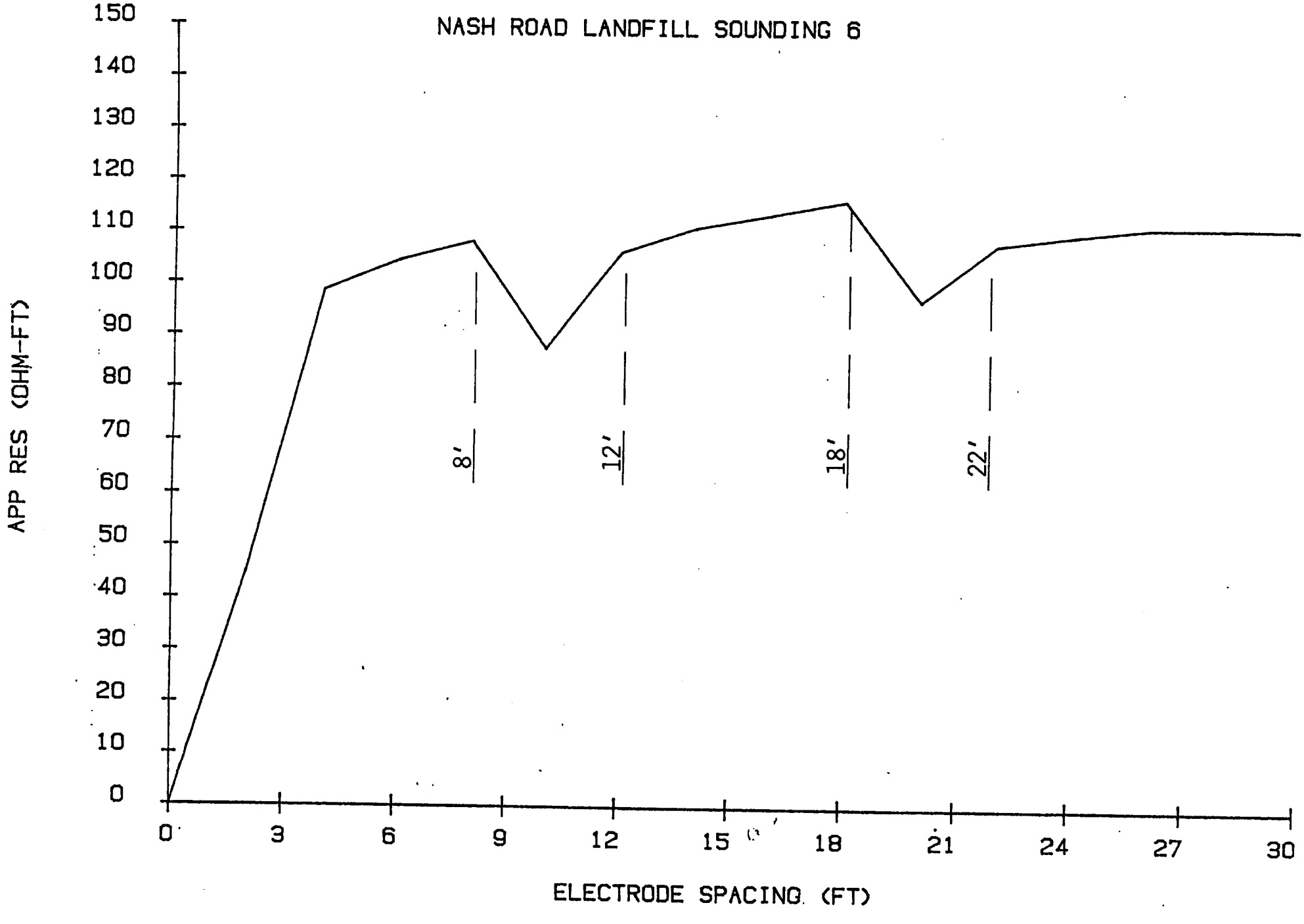

NASH ROAD LANDFILL SOUNDING 1
APP RES (OHM-FT)
250
200
150
100
50
0
0
10
20
30
40
50
60
70
80
90
100
ELECTRODE SPACING (FT)
Fill
5'
11'
15'
22
32'
48'
52'
Top of Rock
62'

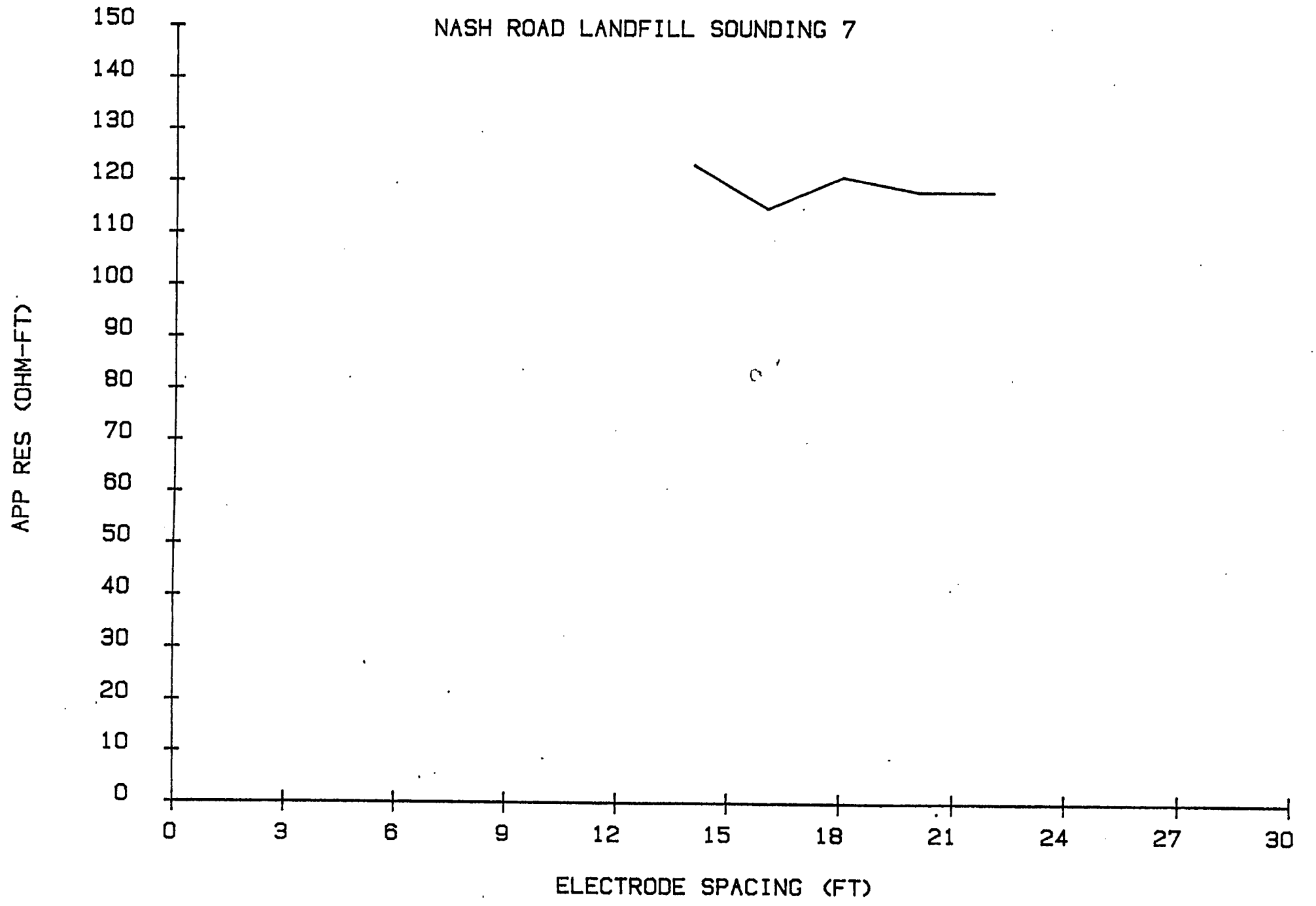

NASH ROAD LANDFILL SOUNDING 2
APP RES (OHM-FT)
500
400
300
200
100
0
0
10
20
30
40
50
60
70
80
90
100
ELECTRODE SPACING (FT)
9'
16'
22'
41'
72' Top of Rock

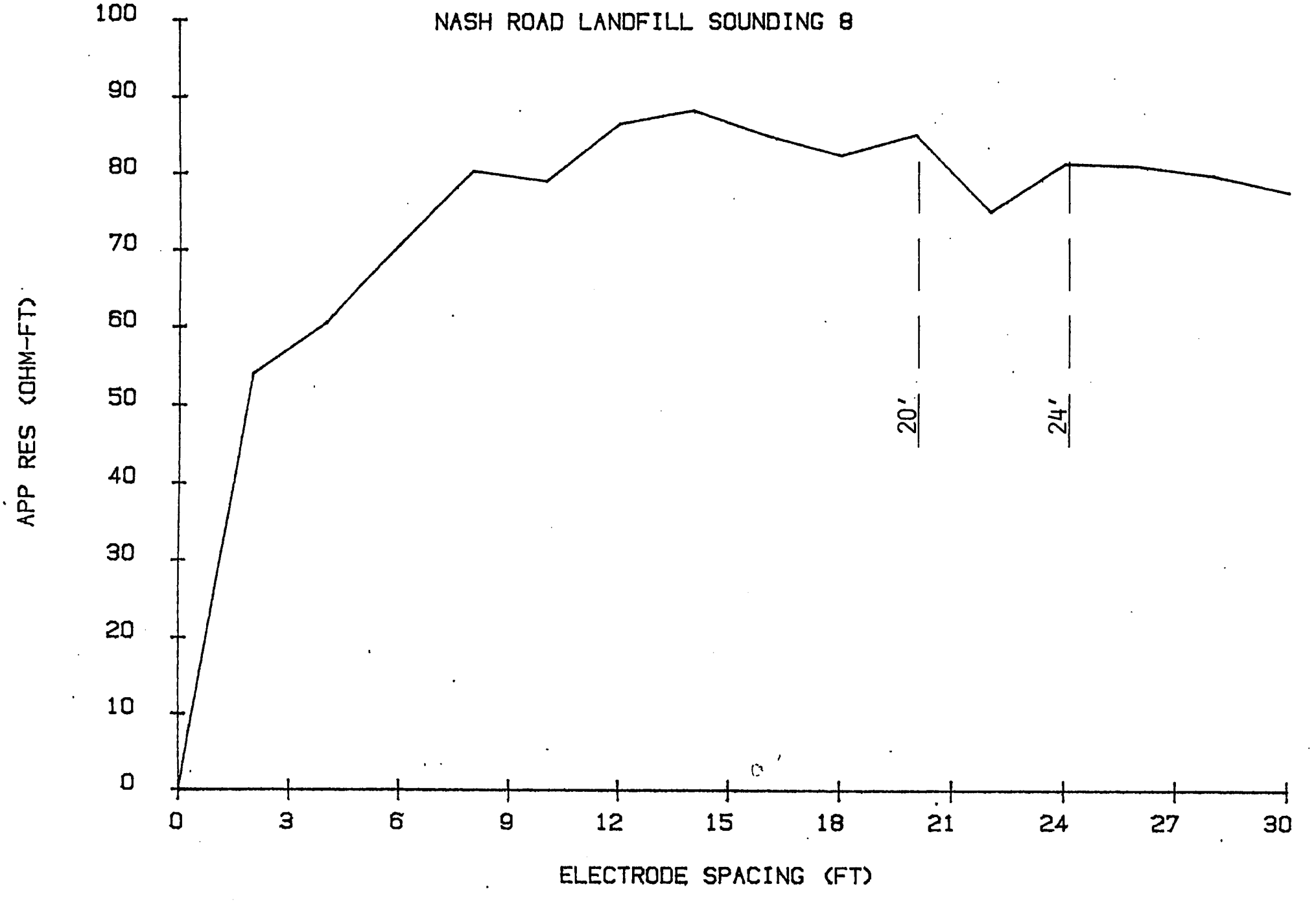

NASH ROAD LANDFILL SOUNDING 3
APP RES (OHM-FT)
250
200
150
100
50
0
22'
25'
0
10
20
30
40
50
60
70
80
90
100
ELECTRODE SPACING (FT)

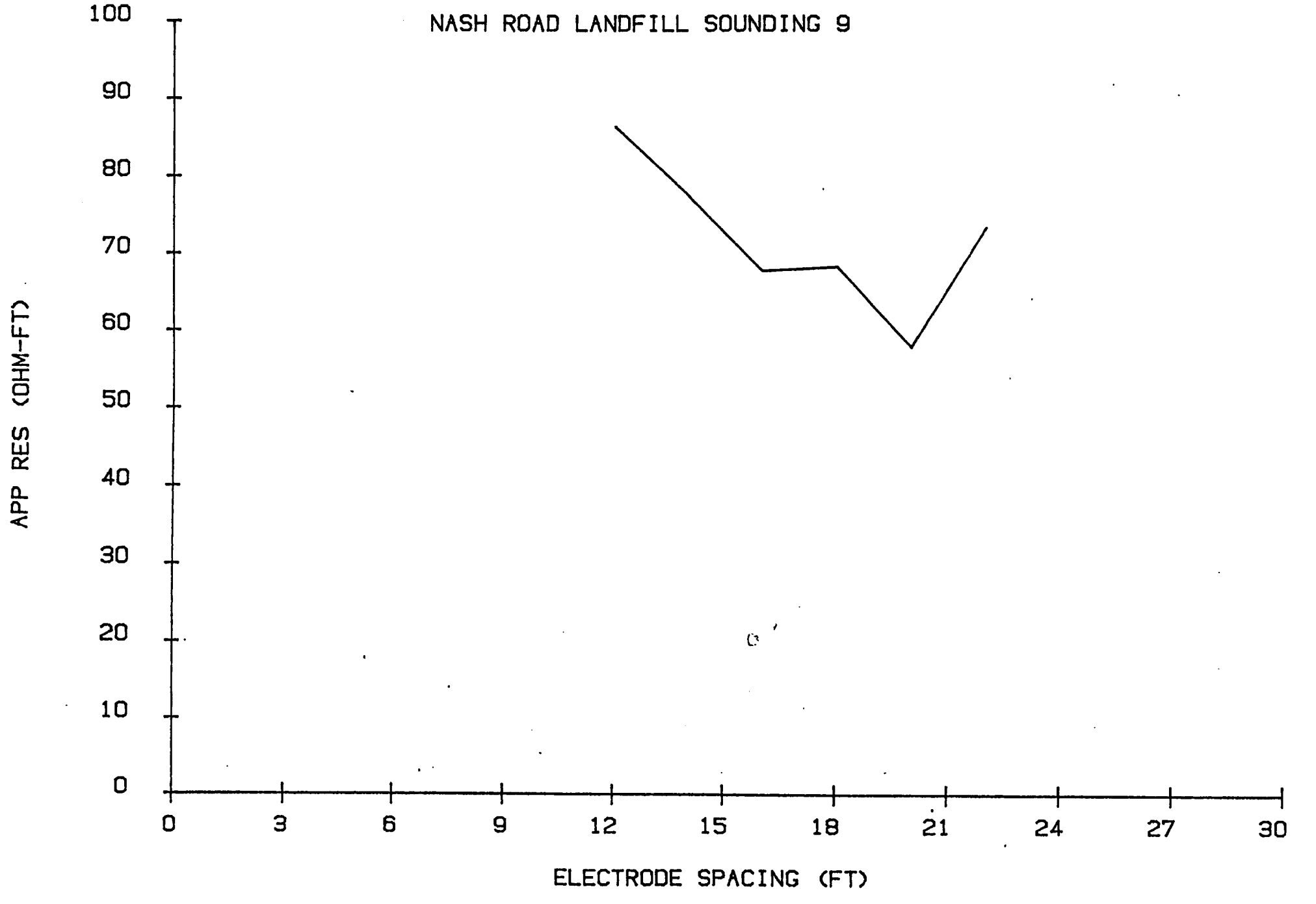

NASH ROAD LANDFILL SOUNDING 4
APP RES (OHM-FT)
150
140
130
120
110
100
90
80
70
60
50
40
30
20
10
0
14'
18'
0
3
6
9
12
15
18
21
24
27
30
ELECTRODE SPACING (FT)

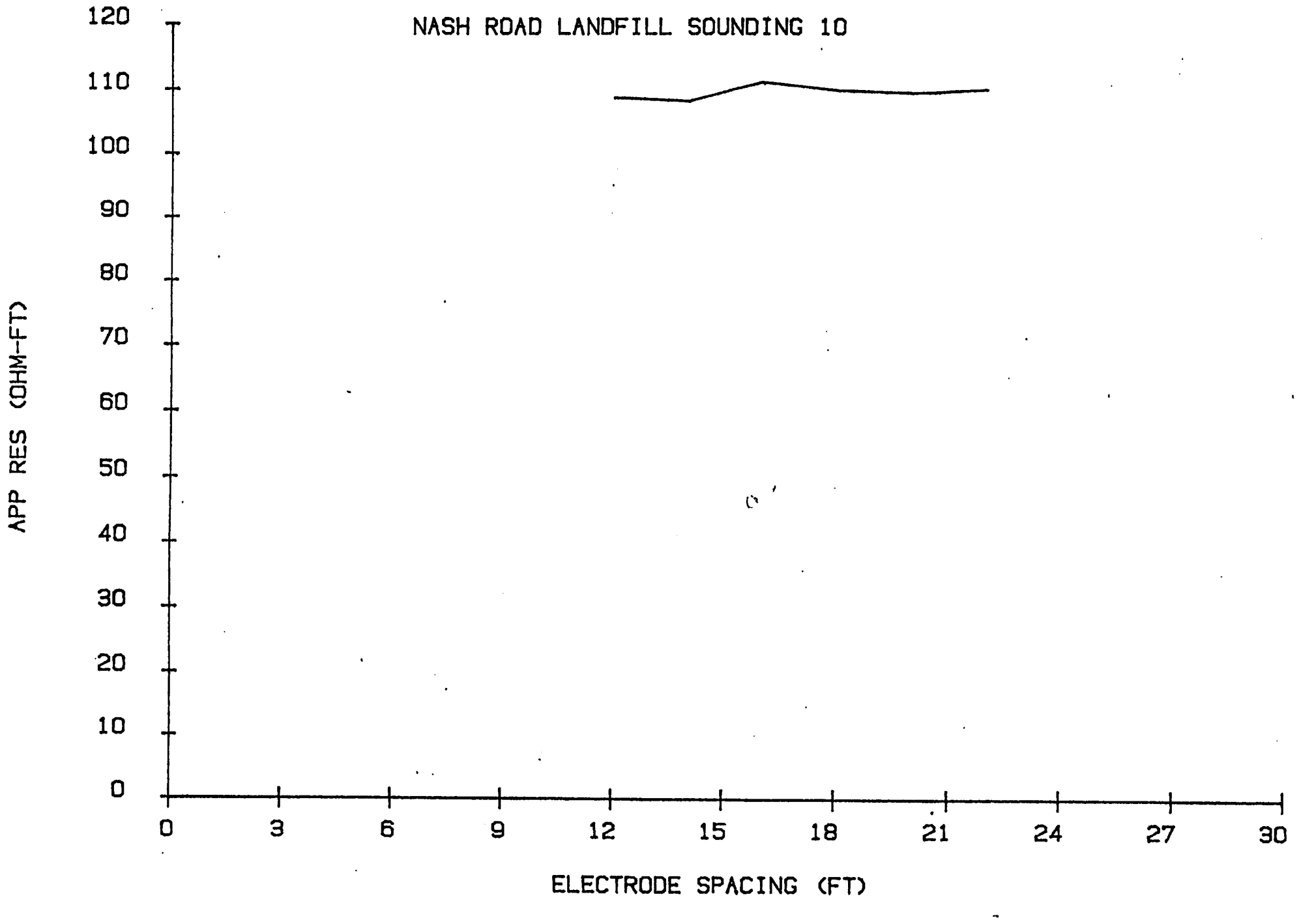

NASH ROAD LANDFILL SOUNDING 5
APP RES (OHM-FT)
150
140
130
120
110
100
90
80
70
60
50
40
30
20
10
0
8'
12'
0
3
6
9
12
15
18
21
24
27
30
ELECTRODE SPACING (FT)

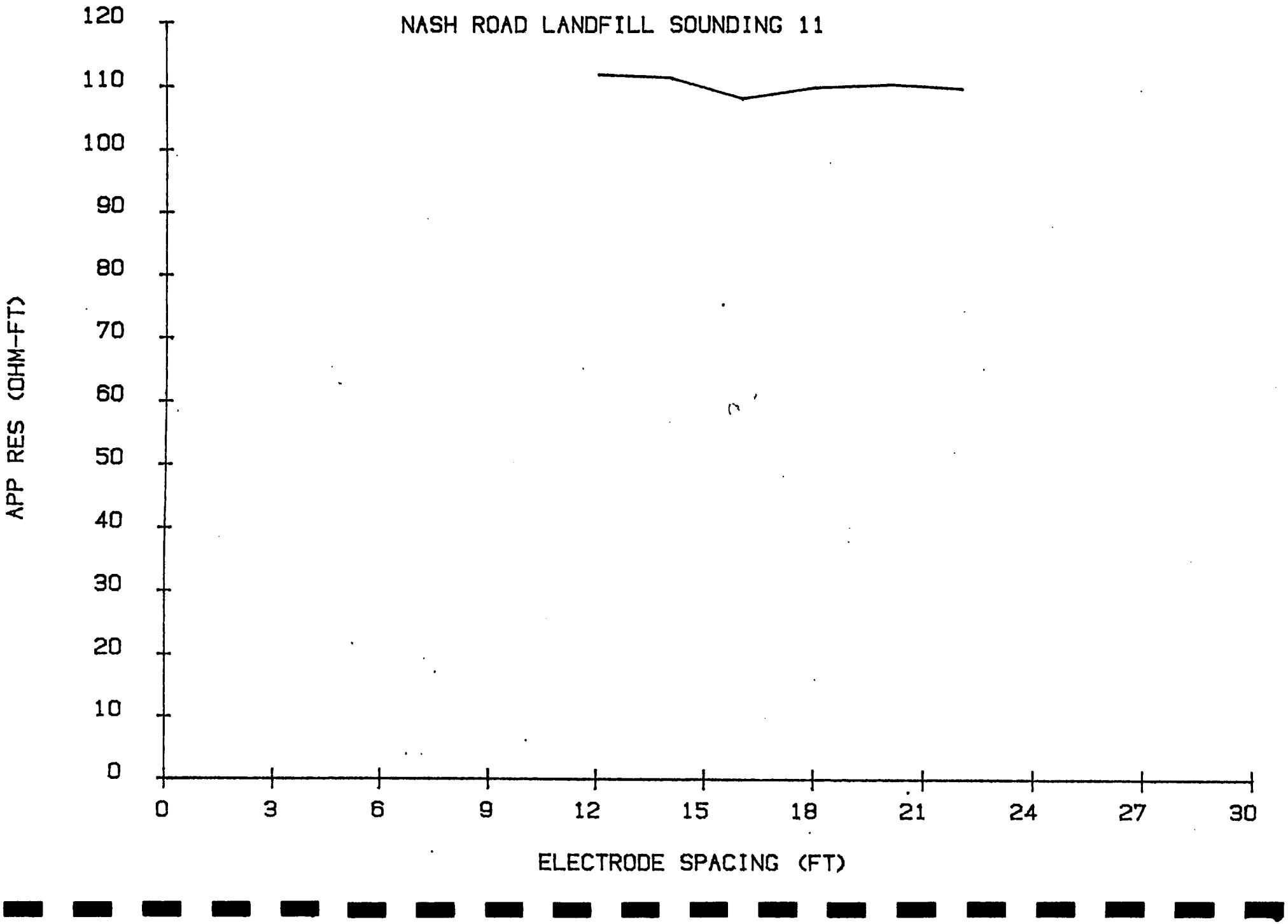

NASH ROAD LANDFILL SOUNDING 6
APP RES (OHM-FT)
150
140
130
120
110
100
90
80
70
60
50
40
30
20
10
0
8'
12'
18'
22'
0
3
6
9
12
15
18
21
24
27
30
ELECTRODE SPACING (FT)

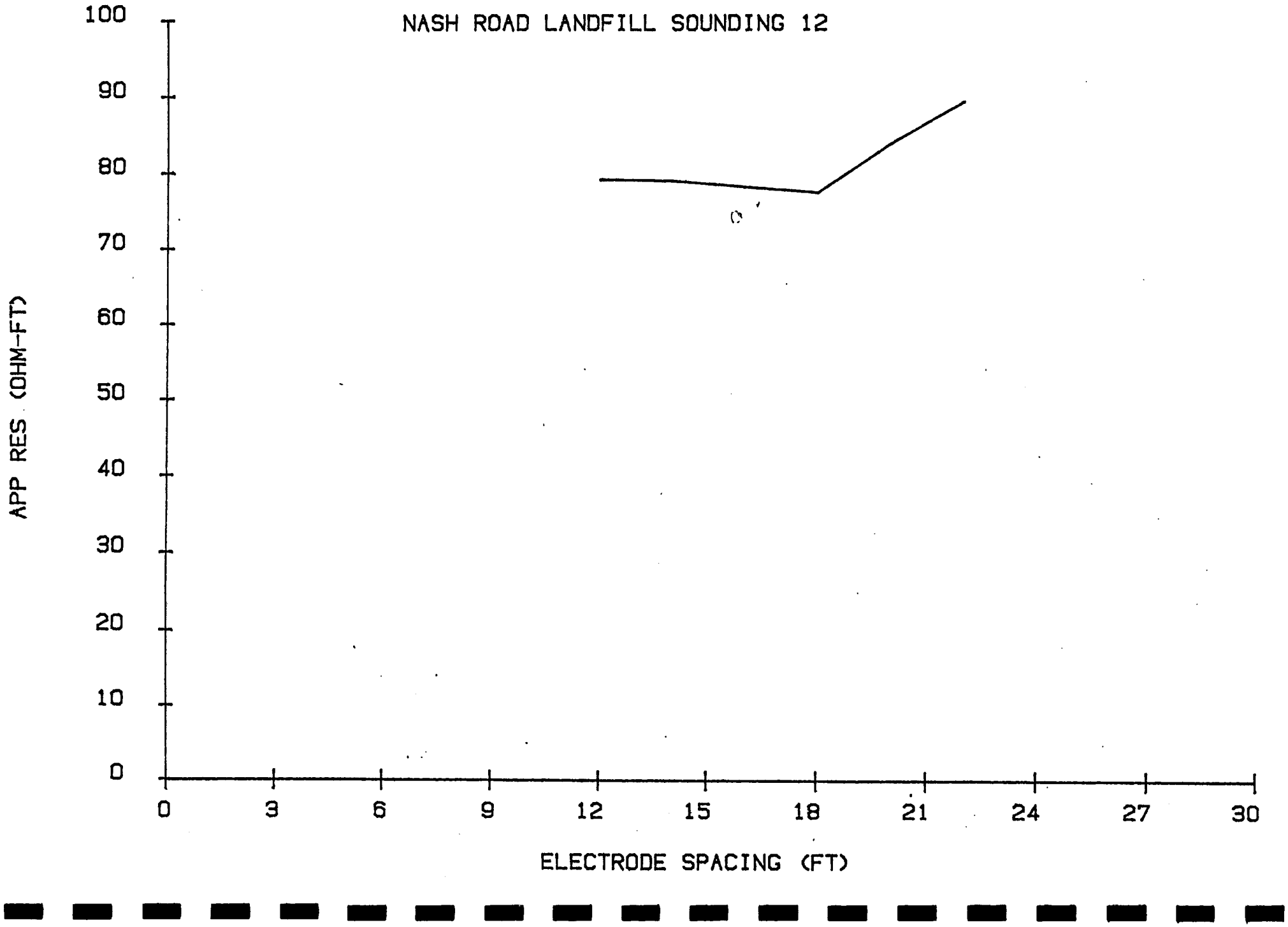

NASH ROAD LANDFILL SOUNDING 7
APP RES (OHM-FT)
150
140
130
120
110
100
90
80
70
60
50
40
30
20
10
0
0
3
6
9
12
15
18
21
24
27
30
ELECTRODE SPACING (FT)


NASH ROAD LANDFILL SOUNDING 8
APP RES (OHM-FT)
100
90
80
70
60
50
40
30
20
10
0
0
3
6
9
12
15
18
21
24
27
30
20'
24'
ELECTRODE SPACING (FT)


NASH ROAD LANDFILL SOUNDING 9
APP RES (OHM-FT)
100
90
80
70
60
50
40
30
20
10
0
0
3
6
9
12
15
18
21
24
27
30
ELECTRODE SPACING (FT)


NASH ROAD LANDFILL SOUNDING 10
APP RES (OHM-FT)
120
110
100
90
80
70
60
50
40
30
20
10
0
0
3
6
9
12
15
18
21
24
27
30
ELECTRODE SPACING (FT)


NASH ROAD LANDFILL SOUNDING 11
APP RES (OHM-FT)
120
110
100
90
80
70
60
50
40
30
20
10
0
0
3
6
9
12
15
18
21
24
27
30
ELECTRODE SPACING (FT)


NASH ROAD LANDFILL SOUNDING 12
APP RES (OHM-FT)
100
90
80
70
60
50
40
30
20
10
0
0
3
6
9
12
15
18
21
24
27
30
ELECTRODE SPACING (FT)

APPENDIX D

CHEMICAL DATA

ENGINEERING-SCIENCE LABORATORY ANALYSIS REPORT

Date: 7/15/83
JOB: NASH ROAD - Phase I
JOB NUMBER: 36330

Sample ID: Five samples received 7/1/83 for volatile organics, base-neutral organics, total organic halogens and pH analysis

Parameter / Sample ID	SW-1	SW-2	SW-3	SW-4	SW-5
Methylene Chloride (ug/L)	11	<10	10	<10	<10
Chloroform (ug/L)	<10	<10	<10	<10	<10
Carbon tetrachloride (ug/L)	<10	<10	<10	<10	<10
Benzene (ug/L)	<10	<10	<10	<10	<10
Toluene (ug/L)	<10	<10	<10	<10	<10
Chlorobenzene (ug/L)	<10	<10	<10	<10	<10
1,1,2-Trichloroethane (ug/L)	<10	<10	<10	<10	<10
Tetrachloroethene (ug/L)	<10	<10	<10	<10	<10
1,1,2,2-Tetrachloroethane (ug/L)	<10	<10	<10	<10	<10
Trichloroethene (ug/L)	<10	<10	<10	<10	<10
Trichlorobenzene Isomers (ug/L)	<10	<10	<10	<10	<10
Dichlorobenzene Isomers (ug/L)	<10	<10	<10	<10	<10
Hexachlorobutadiene (ug/L)	<10	<10	<10	<10	<10
pH (S.U.)	6.9	8.1	7.1	7.4	7.4
Total Organic Halogens (ppm)	0.010	0.005	0.007	0.007	0.008

B.L. Thorpe
Laboratory Supervisor

James W. Andrews, Ph.D.
President
Janette M. Davis
Chief Chemist, VP

SAVANNAH LABORATORIES AND ENVIRONMENTAL SERVICES, INC.

P.O. Box 13842 • Savannah, Ga. 31406
912/354-7858

REPORT OF ANALYSIS

TO: B. L. Thorpe
Engineering-Science
57 Executive Park South, NE
Suite 590
Atlanta,GA. 30329

REPORT NO. 5239

DATE RECEIVED 7/7/83

SAMPLED BY Client

IDENTIFICATION: Samples submitted to laboratory

METHODS: EPA Methods of Analysis (Model 610/O.I. Corp.)

SAMPLE ID.#	TOX CONTENT (ppm)
07-1000-01	0.010
07-1001-01	0.005
07-1002-01	0.007
07-1003-01	0.007
07-1004-01	0.008

Janette M. Davis

Janette M. Davis

CHAIN OF CUSTODY RECORD

PROJ. NO.	PROJECT NAME	NO. OF CONTAINERS	Volatile O.	Organics	Metals	REMARKS
	Nash Rd. - DEC.					

SAMPLERS: (Signature) David T Gregory

STA. NO.	DATE	TIME	COMP.	GRAB	STATION LOCATION	NO. OF CONTAINERS	Volatile O.	Organics	Metals	REMARKS
SW-1	6-29-83	11:40		✓	ditch N. side of trench.	3	✓	✓	✓	surface water oil film. shallow water. some sediment.
SW-2	6-29-83	11:57		✓	bridge separating marsh water from trench location	3	✓	✓	✓	water depth - 10"-
SW-3	6-29-83	12:05		✓	N part of trench near natural drainage	3	✓	✓	✓	14" water depth - oil sheen from bottom sediments.
SW-4	6-29-83	12:15		✓	in open water South side trench area N. side small mound.	3	✓	✓	✓	water depth ≈ 1' water depth 10"
SW5	6-29	12:26		✓	W. end open water	3	✓	✓	✓	

Relinquished by: (Signature)	Date / Time	Received by: (Signature)	Relinquished by: (Signature)	Date / Time	Received by: (Signature)
David T Gregory	6-29-83 3:30 PM				
Relinquished by: (Signature)	Date / Time	Received by: (Signature)	Relinquished by: (Signature)	Date / Time	Received by: (Signature)
	7/1	Ron Hamm			
Relinquished by: (Signature)	Date / Time	Received for Laboratory by: (Signature)	Date / Time	Remarks	
		B.L. Thorpe	7/1		

Distribution: Original Accompanies Shipment; Copy to Coordinator Field Files